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INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET EN AUTOMATIQUE

Comparison Tables: BBOB 2009 Noisy Testbed

Anne Auger — Steffen Finck — Nikolaus Hansen — Raymond Ros

N° 0384

April 2010

Domaine 1

A large blue rectangular area containing the text 'Rapport technique' in a serif font. To the left of the text is a large, light grey stylized 'R' logo. A horizontal grey brushstroke is positioned below the text.

*Rapport
technique*

Comparison Tables: BBOB 2009 Noisy Testbed

Anne Auger , Steffen Finck , Nikolaus Hansen , Raymond Ros

Domaine : Mathématiques appliquées, calcul et simulation
Équipe-Projet TAO

Rapport technique n° 0384 — April 2010 — 185 pages

Abstract: This document presents the results in the form of tables from the Black-Box Optimization Benchmarking (BBOB) workshop of the Genetic and Evolutionary Computation Conference (GECCO), Montreal Canada, 2009. Each table presents the comparative performances of the algorithms submitted to BBOB 2009 on one problem from the noisy function testbed.

Key-words: continuous optimization, benchmarking

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Tables de comparaison: suite de fonctions tests bruitées BBOB 2009

Résumé : Ce document présente les résultats sous forme de table du workshop Black-Box Optimization Benchmarking (BBOB) de la conférence Genetic and Evolutionary Computation Conference (GECCO), Montréal Canada, 2009. Chaque table présente les performances des algorithmes soumis à BBOB 2009 pour un problème de la suite de fonctions tests bruitées.

Mots-clés : optimisation continue, banc d'essai

This document provides tabular results of the workshop for Black-Box Optimization Benchmarking at GECCO 2009¹. More than 30 algorithms have been tested on 30 noisy benchmark functions in dimensions between 2 and 40. A description of the used objective functions can be found in [13, 8]. The experimental set-up is described in [12].

The performance measure provided in the following tables is the expected number of objective function evaluations to reach a given target function value (ERT, expected running time), divided by the respective value for the best algorithm. Consequently, the best (smallest) value is 1 and the value 1 appears in each column at least once. See [12] for details on how ERT is obtained. All numbers are computed with no more than two digits of precision.

¹see <http://coco.gforge.inria.fr/doku.php?id=bbob-2009>

Table 1: 02-D, running time excess ERT/ERT_{best} on f_{101} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

101 Sphere moderate Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.9	4	5	5.57	7.17	8.43	9.77	11.3	ERT_{best}/D
ALPS	1	1	1.6	4.9	32	78	120	160	190	250	ALPS [15]
AMaLGaM IDEA	1	1	2	2.6	5	7.4	8.1	8.8	9.6	12	AMaLGaM IDEA [4]
avg NEWUOA	1	1	3.2	1.7	2.1	2.3	2	1.9	1.7	1.6	avg NEWUOA [23]
BayEDAcG	1	1	2	4.9	110	150	160	190	170	190	BayEDAcG [9]
BFGS	1	1	140	250	1900	1e4	<i>14e-2/4e3</i>	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	5.3	2.5	5.8	7.7	8.5	9.3	11	13	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	3.3	2	3.9	5.5	5.8	6.3	6.1	7.2	(1+1)-CMA-ES [2]
DASA	1	1	57	33	40	46	49	45	46	51	DASA [18]
DEPSO	1	1	2.7	5.4	20	26	34	34	37	44	DEPSO [11]
EDA-PSO	1	1	1.4	3.9	13	18	22	27	31	59	EDA-PSO [5]
full NEWUOA	1	1	3.2	1.3	1.4	1.4	1.1	1	1	1	full NEWUOA [23]
GLOBAL	1	1	1.4	6.2	22	27	22	19	17	17	GLOBAL [20]
iAMaLGaM IDEA	1	1	2.5	1.9	4	5.9	6.5	6.6	7.2	8.4	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	2.4	5.1	13	22	29	30	27	26	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1.1	1.2	1.5	1.2	21	210	1200	MCS (Neum) [16]
NEWUOA	1	1	2.4	1.8	2.1	2.3	2.5	2.3	2	1.9	NEWUOA [23]
(1+1)-ES	1	1	3.3	2.3	3.5	5.2	5.3	5.9	6	7.5	(1+1)-ES [1]
PSO	1	1	2.3	3.6	13	31	52	73	88	130	PSO [6]
PSO_Bounds	1	1	2.8	2.6	11	40	110	180	240	330	PSO_Bounds [7]
Monte Carlo	1	1	1.9	3.7	34	330	3100	1.8e4	3.1e5	<i>17e-6/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	2.9	1.9	4.3	6.3	6.2	7.3	7.8	9.2	IPOP-SEP-CMA-ES [21]
SNBOFIT	1	1	2	1	1	1	1	1.2	1.6	1.9	SNBOFIT [17]
VNS (Garcia)	1	1	2.6	6	14	17	16	15	15	15	VNS (Garcia) [10]

Table 2: 02-D, running time excess ERT/ERT_{best} on f_{102} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	102 Sphere moderate unif										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.9	3.53	5.37	8.3	9.57	11.1	12.5	15.5	ERT_{best}/D
ALPS	1	1	2.1	4.4	20	68	91	120	150	190	ALPS [15]
AMaLGaM IDEA	1	1.1	2.2	3.4	4.4	5	6	7.1	8.1	8.7	AMaLGaM IDEA [4]
avg NEWUOA	1	1.2	4	2.1	2.6	4.4	4.1	3.7	3.4	2.8	avg NEWUOA [23]
BayEDAcG	1	1	1.8	5.8	9	71	98	92	88	77	BayEDAcG [9]
BFGS	1	1	99	340	1e3	<i>11e-2/4e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	3.6	2.8	4.7	5.5	6.9	7.8	8.6	9.4	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	2.4	1.9	3	3.8	4.3	4.5	4.9	5.3	(1+1)-CMA-ES [2]
DASA	1	13	70	57	50	43	44	44	44	47	DASA [18]
DEPSO	1	1	2.7	5	13	17	24	24	28	34	DEPSO [11]
EDA-PSO	1	1	1.7	3.6	9.9	12	17	22	27	43	EDA-PSO [5]
full NEWUOA	1	1	4	1.7	1.5	1	1	1	1	1	full NEWUOA [23]
GLOBAL	1	1	2.8	5	18	18	17	15	13	11	GLOBAL [20]
iAMaLGaM IDEA	1	1	2.7	3.3	4.1	4.3	4.8	5.5	6	6.7	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	2.4	5.8	11	15	21	22	21	19	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1.2	1.1	1.2	1.4	200	350	3600	MCS (Neum) [16]
NEWUOA	1	1	7.1	11	9.3	7	6.6	5.8	5.2	4.4	NEWUOA [23]
(1+1)-ES	1	1	2.2	2.3	3.2	3.2	4	4.4	4.9	5.4	(1+1)-ES [1]
PSO	1	1	3	2.9	11	19	40	50	64	90	PSO [6]
PSO_Bounds	1	1.1	3.2	6.5	14	32	82	140	180	240	PSO_Bounds [7]
Monte Carlo	1	1	2	4.5	25	140	3100	1.1e4	2.6e5	<i>12e-6/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	5.3	3.2	4.9	5.8	6.2	6.6	6.8	7.5	IPOP-SEP-CMA-ES [21]
SNBOFIT	1	1	2	1	1	1	1.4	1.7	4.5	4.3	SNBOFIT [17]
VNS (Garcia)	1	1	2.6	7	12	12	12	11	12	12	VNS (Garcia) [10]

Table 3: 02-D, running time excess ERT/ERT_{best} on f_{103} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

103 Sphere moderate Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.9	3.93	4.7	4.7	4.7	4.9	4.9	6.77	ERT_{best}/D
ALPS	1	1	3.1	4.6	44	110	190	310	420	6700	ALPS [15]
AMaLGaM IDEA	1	1	1.5	2.3	5.6	7.8	12	16	180	340	AMaLGaM IDEA [4]
avg NEWUOA	1	1	3.1	1.8	2.1	3	4.1	4.4	7.1	6.9	avg NEWUOA [23]
BayEDAcG	1	1.1	2.6	2.5	81	180	190	200	210	270	BayEDAcG [9]
BFGS	1	1	8.6	3.5	4.5	4.6	4.6	4.4	4.4	3.2	BFGS [22]
BIPOP-CMA-ES	1	1	3.9	3.1	6	9.9	14	17	24	24	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	2.1	1.7	4	6	13	30	77	150	(1+1)-CMA-ES [2]
DASA	1	1	42	22	37	130	260	1e3	3e3	1.9e4	DASA [18]
DEPSO	1	1	1.6	2.7	13	24	34	62	89	230	DEPSO [11]
EDA-PSO	1	1	2.2	3.4	8.9	20	31	60	200	1.3e4	EDA-PSO [5]
full NEWUOA	1	1	3.3	1.5	1.5	1.6	1.6	1.6	1.7	1.2	full NEWUOA [23]
GLOBAL	1	1	2	3.1	23	30	34	33	39	52	GLOBAL [20]
iAMaLGaM IDEA	1	1	2.5	2.6	4.1	6.7	9.2	13	230	860	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	2.7	3.8	14	27	47	60	72	63	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1.3	1.9	1.9	1.9	100	120	MCS (Neum) [16]
NEWUOA	1	1	3.2	1.6	2.1	3.1	4.2	4.9	6.4	7.8	NEWUOA [23]
(1+1)-ES	1	1	2.1	1.5	4.2	7.2	11	36	78	290	(1+1)-ES [1]
PSO	1	1.1	3.4	3.4	11	37	100	240	770	2.8e4	PSO [6]
PSO_Bounds	1	1	2.5	3.8	17	55	210	3400	5700	4.3e4	PSO_Bounds [7]
Monte Carlo	1	1	2.4	3	34	320	3700	3.2e4	3.1e5	<i>96e-7/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	4.2	3.3	5.3	7.9	11	14	18	19	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	2.4	1	1	1	1	1	1	1	SNOBFIT [17]
VNS (Garcia)	1	1	2.6	6.7	14	21	24	26	29	29	VNS (Garcia) [10]

Table 4: 02-D, running time excess ERT/ERT_{best} on f_{104} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

104 Rosenbrock moderate Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.6	2	2.7	7.27	96.9	120	124	126	128	132	ERT_{best}/D
ALPS	2.3	3.3	11	20	5.5	11	19	28	38	58	ALPS [15]
AMaLGaM IDEA	2.9	3.4	5.8	6.5	1.1	1.3	1.6	1.8	1.9	2.2	AMaLGaM IDEA [4]
avg NEWUOA	5.2	2.8	4.3	7.8	1.2	3.5	5.3	6.4	6.8	8.7	avg NEWUOA [23]
BayEDAcG	3.1	2.8	5.8	28	32	<i>12e-2/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	140	110	190	390	220	<i>60e-2/3e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.7	2.3	24	12	2.5	3.5	3.8	4.3	4.6	4.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	4.9	3.7	8.7	12	1.9	2.4	3	3	3.2	3.3	(1+1)-CMA-ES [2]
DASA	59	27	89	160	94	130	220	880	2100	4.4e4	DASA [18]
DEPSO	2.6	2.6	15	19	4.6	6.4	8.4	14	23	<i>64e-7/2e3</i>	DEPSO [11]
EDA-PSO	1.8	2.7	5.8	12	7.1	18	36	51	65	97	EDA-PSO [5]
full NEWUOA	4.9	2.5	6.2	10	1.1	1	1	1	1	1	full NEWUOA [23]
GLOBAL	2.2	2.4	9	14	1.4	1.4	1.4	1.4	1.4	1.5	GLOBAL [20]
iAMaLGaM IDEA	3.9	2.6	4.1	6.1	1	1.3	1.4	1.6	1.7	1.9	iAMaLGaM IDEA [4]
MA-LS-Chain	2.5	2.1	7.7	8.9	1.9	2.6	3.3	3.4	3.5	3.9	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	5.7	40	80	490	2900	<i>20e-5/3e4</i>	MCS (Neum) [16]
NEWUOA	7.3	2.9	6.4	13	3.4	6.5	10	13	12	13	NEWUOA [23]
(1+1)-ES	4.8	4	5.1	12	1.8	10	21	140	240	3e3	(1+1)-ES [1]
PSO	2.2	1.9	5.3	8.2	3.2	5	8.1	13	17	28	PSO [6]
PSO_Bounds	1.9	3.3	6.6	14	4.5	8.9	27	42	59	87	PSO_Bounds [7]
Monte Carlo	2.8	2.3	7	17	8.6	120	1600	1.3e4	1.1e5	<i>11e-5/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	3.3	2.1	4.9	21	7.7	7.7	7.7	7.7	7.7	7.7	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.7	2	3.4	3.7	4.5	13	28	50	87	140	SNOBFIT [17]
VNS (Garcia)	9.5	3.9	8.2	14	2.3	2.3	2.5	2.6	2.7	3	VNS (Garcia) [10]

Table 5: 02-D, running time excess ERT/ERT_{best} on f_{105} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

105 Rosenbrock moderate unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.6	2	2.7	7.37	178	186	190	195	198	205	ERT_{best}/D
ALPS	2.2	3	4.1	22	3.7	8	13	19	26	38	ALPS [15]
AMaLGaM IDEA	1.4	1.7	5.6	120	5.6	5.8	5.9	5.9	6	6	AMaLGaM IDEA [4]
avg NEWUOA	6.4	3.7	7	13	2.3	8.6	29	55	200	390	avg NEWUOA [23]
BayEDAcG	3.9	2.3	8.7	29	14	71	<i>12e-2/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	64	54	140	340	71	220	<i>32e-2/3e3</i>	.	.	.	BFGS [22]
BIPOP-CMA-ES	3.8	1.6	5.5	5.7	1.1	2.6	3.6	3.6	3.8	4.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.2	2.2	11	16	2	3.9	6.6	6.7	6.7	6.6	(1+1)-CMA-ES [2]
DASA	53	29	93	300	55	100	350	1200	2300	5.6e4	DASA [18]
DEPSO	2.3	3.4	5.8	14	1.5	3.3	5.8	7.4	18	150	DEPSO [11]
EDA-PSO	4.3	3.5	6.1	12	2	8.7	19	29	41	60	EDA-PSO [5]
full NEWUOA	4.8	3.3	4.8	19	2.7	8.3	11	14	17	48	full NEWUOA [23]
GLOBAL	3.3	2.8	4.7	15	1	1	1	1	1	1	GLOBAL [20]
iAMaLGaM IDEA	2.7	2.4	3.2	24	7.2	8	8	8	8	7.9	iAMaLGaM IDEA [4]
MA-LS-Chain	4.3	3	5.9	11	1.6	4.7	6.6	8.6	8.7	8.7	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	3.2	26	120	300	<i>43e-5/3e4</i>	.	MCS (Neum) [16]
NEWUOA	6.3	2.7	7.9	16	3.1	6.3	22	42	41	110	NEWUOA [23]
(1+1)-ES	3.9	2.3	9.8	18	3.1	10	31	82	220	2e3	(1+1)-ES [1]
PSO	3.2	2.5	4.7	11	1.8	3.6	6.4	9.1	13	19	PSO [6]
PSO_Bounds	2.9	2.8	4.9	8.8	2.3	8.7	19	31	39	52	PSO_Bounds [7]
Monte Carlo	3.7	2.6	7.3	32	8.3	68	550	7400	<i>14e-5/1e6</i>	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	6	2.9	38	53	6.4	9.3	9.3	9.2	9.1	9	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.3	1.8	3.1	6.1	1.6	5.6	7.6	12	22	34	SNOBFIT [17]
VNS (Garcia)	9.5	3.9	9	13	3.5	8.2	8.2	12	12	14	VNS (Garcia) [10]

Table 6: 02-D, running time excess ERT/ERT_{best} on f_{106} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

106 Rosenbrock moderate Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.6	2	2.7	7.6	69.5	140	176	206	245	325	ERT_{best}/D
ALPS	3.2	3.2	10	15	7.2	8.2	14	25	72	1400	ALPS [15]
AMaLGaM IDEA	2.6	1.9	4.6	5.8	16	13	11	11	17	27	AMaLGaM IDEA [4]
avg NEWUOA	4.6	2.2	3.7	4.5	2.1	2.1	3.2	3.3	4.3	5.9	avg NEWUOA [23]
BayEDAcG	2.4	2.3	6.1	31	17	95	160	<i>66e-3/2e3</i>	.	.	BayEDAcG [9]
BFGS	16	10	13	13	2.5	2.1	1.8	1.8	1.8	1.4	BFGS [22]
BIPOP-CMA-ES	4.1	2.1	8	17	3.3	2.8	2.6	2.6	2.4	2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.2	2.5	5	6.4	1.2	1.7	3	5	6.6	16	(1+1)-CMA-ES [2]
DASA	56	28	96	160	100	160	150	760	3100	<i>30e-7/8e5</i>	DASA [18]
DEPSO	4.4	6	17	19	5.1	5.6	10	18	40	<i>11e-5/2e3</i>	DEPSO [11]
EDA-PSO	3.1	1.9	5	9.3	5.1	12	19	27	43	1e3	EDA-PSO [5]
full NEWUOA	8.8	4	5	5.1	1	1	1	1.1	1	1	full NEWUOA [23]
GLOBAL	2.2	3.4	7.4	11	2.1	1.3	1.1	1	1.2	1.9	GLOBAL [20]
iAMaLGaM IDEA	2.7	2.5	5.2	61	16	17	16	15	20	43	iAMaLGaM IDEA [4]
MA-LS-Chain	4.2	2.8	5.7	10	2.9	2.5	2.3	2.4	2.4	2.1	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	8	39	76	210	750	<i>11e-5/3e4</i>	MCS (Neum) [16]
NEWUOA	3.1	2.1	2.6	6.1	2	2.3	3.2	3.2	4.8	5.7	NEWUOA [23]
(1+1)-ES	5.6	3.8	5.1	10	3.3	8.7	19	90	200	4400	(1+1)-ES [1]
PSO	2.8	1.8	3.3	9	4.1	5	8	37	140	510	PSO [6]
PSO_Bounds	3.3	3	10	11	7.3	11	52	66	150	930	PSO_Bounds [7]
Monte Carlo	3.2	2.2	6.3	22	20	130	1500	8300	5.9e4	<i>12e-5/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	4	2.7	5.2	11	4.4	2.9	2.5	2.3	2	1.6	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.3	2.5	3.5	6.9	2.6	7.7	12	28	74	<i>63e-5/3e3</i>	SNOBFIT [17]
VNS (Garcia)	9.5	3.9	9.7	17	3.8	2.2	2.1	1.9	1.7	1.5	VNS (Garcia) [10]

Table 7: 02-D, running time excess ERT/ERT_{best} on f_{107} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

107 Sphere Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.9	6.6	13.9	56.7	78.8	101	128	211	ERT_{best}/D
ALPS	1	1	2.6	3.5	12	9.9	12	15	16	15	ALPS [15]
AMaLGaM IDEA	1	1	2.3	1.7	2.3	1	1	1	1	1.9	AMaLGaM IDEA [4]
avg NEWUOA	1	1	14	32	24	13	15	31	45	80	avg NEWUOA [23]
BayEDAcG	1	1.1	2.4	1.2	4	4.2	4.4	4.7	4.7	4.4	BayEDAcG [9]
BFGS	1	1	98	110	300	880	660	520	410	<i>65e-3/4e3</i>	BFGS [22]
BIPOP-CMA-ES	1	1	12	3.6	2.9	1.2	1.2	1.2	1.2	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	35	7.2	7.7	2.9	2.4	2.3	3.7	6.3	(1+1)-CMA-ES [2]
DASA	1	1	210	130	330	190	440	550	1400	4100	DASA [18]
DEPSO	1	1	2.9	4.8	6.5	3	3.8	3.7	3.6	3.1	DEPSO [11]
EDA-PSO	1	1.1	1.7	2.9	4.9	2.5	4.4	6.4	9.3	9.9	EDA-PSO [5]
full NEWUOA	1	1	12	9.7	21	6.9	9.6	18	19	28	full NEWUOA [23]
GLOBAL	1	1.1	2.6	2.7	6.9	4.8	4.4	4	4.6	8	GLOBAL [20]
iAMaLGaM IDEA	1	1	2.5	47	33	8.4	6.2	5	11	6.8	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	2.3	1.6	4.6	2.8	3.8	3.9	4.5	3	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	18	57	170	1400	<i>86e-6/3e4</i>	MCS (Neum) [16]
NEWUOA	1	1	26	20	31	17	20	37	82	83	NEWUOA [23]
(1+1)-ES	1	1	8.2	8.1	8.3	4.3	3.6	3.3	3.2	4.6	(1+1)-ES [1]
PSO	1	1	2	2.3	4.2	3.2	4.9	6.2	7.1	6.8	PSO [6]
PSO_Bounds	1	1	1.7	2.1	5.1	5.2	8.5	16	19	20	PSO_Bounds [7]
Monte Carlo	1	1	2.1	2.8	13	19	280	2400	1.8e4	7e4	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	41	16	8.5	2.7	2.1	1.8	2.1	1.5	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	2.1	1.1	6.6	6.6	6.5	6.2	6.4	7.3	SNOBFIT [17]
VNS (Garcia)	1	1	2.6	80	42	18	16	12	10	6.3	VNS (Garcia) [10]

Table 8: 02-D, running time excess ERT/ERT_{best} on f_{108} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

108 Sphere unif											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	0.5	0.5	0.9	15	101	713	1710	2610	3680	7990	ERT_{best}/D
ALPS	1	1	2.5	1	1.9	1.3	1.1	1.6	1.9	1.5	ALPS [15]
AMaLGaM IDEA	1	1.1	1.9	1	32	6.2	4.3	4.4	5.9	7.3	AMaLGaM IDEA [4]
avg NEWUOA	1	1	87	42	20	18	16	<i>14e-3/6e3</i>	.	.	avg NEWUOA [23]
BayEDAcG	1	1	3.1	10	18	18	16	<i>86e-3/2e3</i>	.	.	BayEDAcG [9]
BFGS	1	1	29	6.8	4.2	5	7	<i>43e-3/800</i>	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	93	10	5.5	1.5	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	55	14	8.8	4.5	11	26	<i>14e-4/1e4</i>	.	(1+1)-CMA-ES [2]
DASA	1	1	170	93	88	66	100	300	2300	<i>99e-6/6e5</i>	DASA [18]
DEPSO	1	1	2.4	2.9	1.9	2.4	5.4	<i>26e-4/2e3</i>	.	.	DEPSO [11]
EDA-PSO	1	1	1.9	1.1	1.7	1	1.2	1.3	1.6	1.2	EDA-PSO [5]
full NEWUOA	1	1	62	53	42	42	<i>22e-3/7e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.7	1.3	1.3	1.2	4.8	11	<i>34e-4/2e3</i>	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	2.5	48	20	8	9.8	11	9.9	8	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	2.7	1	1.6	1	1	1.4	1.4	1.2	MA-LS-Chain [19]
MCS (Neum)	1	1	1	3.3	2.8	5.5	11	140	<i>43e-5/3e4</i>	.	MCS (Neum) [16]
NEWUOA	1	1	120	56	24	22	25	<i>13e-3/6e3</i>	.	.	NEWUOA [23]
(1+1)-ES	1	1	36	9.4	9	3.4	3.9	14	31	400	(1+1)-ES [1]
PSO	1	1	2.4	1.1	1.3	1.3	1.9	3.3	2.6	1.8	PSO [6]
PSO_Bounds	1	1	2.7	1.1	1	1.3	5.6	5	4.6	2.8	PSO_Bounds [7]
Monte Carlo	1	1	3	1.3	1.8	1.7	8.9	66	480	<i>17e-6/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	600	73	29	6.5	4.5	4.5	5.5	19	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.3	1.2	3.6	2.8	10	14	<i>58e-4/3e3</i>	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.6	46	16	9.4	5.4	3.7	3	4.4	VNS (Garcia) [10]

Table 9: 02-D, running time excess ERT/ERT_{best} on f_{109} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

109 Sphere Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.9	4.77	6.3	33.6	34	48.2	48.2	48.2	ERT_{best}/D
ALPS	1	1	3.1	4.3	25	11	60	330	2400	7.5e4	ALPS [15]
AMaLGaM IDEA	1	1	2.5	3	4.6	14	36	54	100	290	AMaLGaM IDEA [4]
avg NEWUOA	1	1	3.3	2.6	15	7	9	11	15	31	avg NEWUOA [23]
BayEDAcG	1	1	2.7	4.5	12	9.2	13	12	17	28	BayEDAcG [9]
BFGS	1	1	15	8.3	7.6	1.4	1.4	1	1	1	BFGS [22]
BIPOP-CMA-ES	1	1	3.2	2	4.1	1.5	2.3	2.1	3.4	5.4	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	4	2.5	9.3	16	61	240	3e3	<i>49e-6/1e4</i>	(1+1)-CMA-ES [2]
DASA	1	1	96	210	470	440	5700	4.2e4	1.9e5	<i>15e-5/6e5</i>	DASA [18]
DEPSO	1	1	2.8	5.6	18	7.5	13	23	75	<i>15e-6/2e3</i>	DEPSO [11]
EDA-PSO	1	1	2.3	3.1	8.8	4.8	45	490	3800	<i>13e-6/1e5</i>	EDA-PSO [5]
full NEWUOA	1	1	4	1.2	3.3	1	1	1.5	1.5	1.5	full NEWUOA [23]
GLOBAL	1	1	2.1	2.7	18	7.8	12	21	61	<i>15e-6/2e3</i>	GLOBAL [20]
iAMaLGaM IDEA	1	1	2.8	1.8	3	13	29	35	100	320	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	2.2	2.4	10	4.5	9.4	11	16	23	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	15	35	31	38	87	MCS (Neum) [16]
NEWUOA	1	1	3.3	3.6	12	5.6	10	13	22	36	NEWUOA [23]
(1+1)-ES	1	1	3.4	1.8	4.6	3.1	31	140	850	5e4	(1+1)-ES [1]
PSO	1	1	3	2.5	12	9.4	510	1100	4700	<i>17e-6/1e5</i>	PSO [6]
PSO_Bounds	1	1	1.7	2.1	12	230	1500	8500	1.4e4	2.9e4	PSO_Bounds [7]
Monte Carlo	1	1	2.5	2.7	23	58	490	3e3	6.7e4	<i>15e-6/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	3.3	2.5	3.8	1.4	2.4	2.4	3.3	4.5	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.7	1	2.6	1.6	16	24	39	210	SNOBFIT [17]
VNS (Garcia)	1	1	2.6	5	11	3	4.1	3.8	4.7	6.2	VNS (Garcia) [10]

Table 10: 02-D, running time excess ERT/ERT_{best} on f_{110} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

110 Rosenbrock Gauss											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	0.6	2.2	3.57	17.1	312	651	1160	2180	4200	4580	ERT_{best}/D
ALPS	2.8	2	6.8	7.1	1.5	2.1	2.3	1.8	1.4	2.4	ALPS [15]
AMaLGaM IDEA	4.2	2	4.2	67	22	16	9.2	4.9	2.6	2.4	AMaLGaM IDEA [4]
avg NEWUOA	3.8	10	11	5.1	2.5	3	6.8	11	5.9	<i>12e-4/5e3</i>	avg NEWUOA [23]
BayEDAcG	2.4	1.7	5.7	19	10	44	<i>13e-2/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	41	34	62	89	43	41	<i>52e-2/2e3</i>	.	.	.	BFGS [22]
BIPOP-CMA-ES	6.2	3.5	4.1	13	4	5.5	3.4	2.4	1.3	1.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.4	2.5	3.2	9.3	1.7	2.8	2.4	5.8	5.8	32	(1+1)-CMA-ES [2]
DASA	130	140	150	110	32	47	100	190	270	2100	DASA [18]
DEPSO	2.2	1.6	11	6.9	1	1	1	1	1.4	<i>17e-6/2e3</i>	DEPSO [11]
EDA-PSO	2.2	1.7	5.3	6.4	1.6	3.2	3.3	2.9	1.9	2.6	EDA-PSO [5]
full NEWUOA	21	17	26	17	2.8	8.5	<i>62e-4/6e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	2.7	2	4.9	4.7	1.3	2	6.1	<i>10e-3/800</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.4	1.8	100	22	9	6.6	4.1	2.5	1.4	1.3	iAMaLGaM IDEA [4]
MA-LS-Chain	3	2.4	6.1	5.8	1.2	2.1	2.2	1.8	1	1.9	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1.9	10	93	<i>18e-4/3e4</i>	.	.	MCS (Neum) [16]
NEWUOA	22	15	16	15	2.9	4.4	9.1	36	<i>19e-4/5e3</i>	.	NEWUOA [23]
(1+1)-ES	3.9	5.9	4.9	6.9	1.6	2.8	6.4	7.2	9.8	49	(1+1)-ES [1]
PSO	3.1	1.9	5.8	6.6	1.1	1.5	1.4	1.3	1.2	1.6	PSO [6]
PSO_Bounds	2.9	2.1	7.5	12	2	2.8	3.1	2.8	2.2	3	PSO_Bounds [7]
Monte Carlo	3.1	2.7	5.5	11	5.9	22	180	660	3600	<i>65e-6/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	4.3	4.2	4.8	28	4.5	4.4	3.8	2.1	1.1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	3.1	2.4	5.6	7.8	2.8	3.4	5.3	16	<i>57e-4/3e3</i>	.	SNOBFIT [17]
VNS (Garcia)	9.5	3.5	5.9	5.3	7.3	9	5.5	3.3	2.3	3.2	VNS (Garcia) [10]

Table 11: 02-D, running time excess ERT/ERT_{best} on f_{111} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

111 Rosenbrock unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.6	3.73	12.1	59.4	359	2710	6360	14600	30900	84600	ERT_{best}/D
ALPS	2.9	1.8	1.9	4.1	2.7	1.1	1	1	1	1	ALPS [15]
AMaLGaM IDEA	2.5	1	1	7.6	8.3	6.3	5.5	5.5	3.2	2.1	AMaLGaM IDEA [4]
avg NEWUOA	72	48	45	29	53	33	<i>26e-2/6e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	2.8	1.1	2	6.4	36	10	<i>35e-2/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	7.8	8.4	7.7	8.2	<i>59e-2/700</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.5	2.6	7.3	6	2.4	1.5	4.2	5.9	3.1	1.3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	4.1	1.8	7.4	6.5	4	3.6	7.6	10	<i>64e-4/1e4</i>	.	(1+1)-CMA-ES [2]
DASA	230	110	120	91	88	39	110	290	<i>90e-5/6e5</i>	.	DASA [18]
DEPSO	1.7	2.6	3.3	5.7	5.7	11	<i>28e-3/2e3</i>	.	.	.	DEPSO [11]
EDA-PSO	2.1	1.7	1.4	2.1	2.2	1.1	4.7	5.1	6.4	17	EDA-PSO [5]
full NEWUOA	94	37	26	27	31	35	<i>15e-2/7e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	1.7	1.4	1.9	2.2	2.4	1.8	3.5	<i>54e-3/2e3</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.9	1.6	1.4	28	21	10	6.2	4	3.1	3.1	iAMaLGaM IDEA [4]
MA-LS-Chain	3.4	1.8	1.7	1.3	2.2	1	1.2	2.1	2.2	<i>24e-5/1e4</i>	MA-LS-Chain [19]
MCS (Neum)	1	2.4	1.4	1	4.3	5.5	56	<i>75e-4/3e4</i>	.	.	MCS (Neum) [16]
NEWUOA	140	33	21	25	19	11	<i>68e-3/6e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	46	12	14	11	5.6	2.1	5.7	10	21	82	(1+1)-ES [1]
PSO	2.5	1.2	1.9	2	1	4.2	4.6	6.4	5.6	8.2	PSO [6]
PSO_Bounds	2.6	1.6	1.7	1.3	21	3.2	2.3	2.6	2.3	1.5	PSO_Bounds [7]
Monte Carlo	3.9	1.6	1.5	2.7	5.5	4.3	2.8	130	480	<i>14e-5/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	4.6	1.8	11	16	7.4	2.6	2.8	4.8	4.6	<i>11e-4/1e4</i>	IPOP-SEP-CMA-ES [21]
SNOBFIT	5	2.4	2.8	4.2	10	6.4	5.6	2.5	1.2	<i>10e-2/3e3</i>	SNOBFIT [17]
VNS (Garcia)	9.5	2.1	78	62	22	5.6	4.1	2.9	2.5	47	VNS (Garcia) [10]

Table 12: 02-D, running time excess ERT/ERT_{best} on f_{112} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	112 Rosenbrock Cauchy										
$\Delta ftarget$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta ftarget$
ERT_{best}/D	0.6	2	2.7	7.3	312	522	577	618	686	766	ERT_{best}/D
ALPS	2.3	2.9	9.2	15	1.6	3.5	7.6	78	880	4.7e4	ALPS [15]
AMaLGaM IDEA	2.7	1.7	4.3	64	14	11	26	32	56	91	AMaLGaM IDEA [4]
avg NEWUOA	4.7	2.5	5.1	11	1.1	4.6	22	120	<i>19e-4/5e3</i>	.	avg NEWUOA [23]
BayEDAcG	2.4	2.2	4.5	27	4.8	<i>88e-3/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	33	27	36	47	3.4	12	16	29	39	<i>14e-3/4e3</i>	BFGS [22]
BIPOP-CMA-ES	4.7	3	37	44	1.7	1.6	1.7	1.7	1.7	1.7	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.4	2	4.3	13	1.9	3	13	110	<i>52e-5/1e4</i>	.	(1+1)-CMA-ES [2]
DASA	43	23	140	160	26	71	270	3400	<i>19e-5/7e5</i>	.	DASA [18]
DEPSO	3.6	4	7.4	13	1.2	3.8	8.7	<i>34e-4/2e3</i>	.	.	DEPSO [11]
EDA-PSO	3	2.5	8.1	9.2	1.9	6	23	290	2100	<i>12e-5/1e5</i>	EDA-PSO [5]
full NEWUOA	6.9	3	3.1	16	1.3	2.5	7.4	13	25	53	full NEWUOA [23]
GLOBAL	3.3	2.2	8.1	16	1.2	3	2.9	7.7	7	<i>10e-3/1e3</i>	GLOBAL [20]
iAMaLGaM IDEA	1.9	1.7	4	100	14	19	35	65	67	100	iAMaLGaM IDEA [4]
MA-LS-Chain	2.1	2.2	6.3	7.7	1	1.7	2.8	3.8	3.9	9.5	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	7.7	31	87	<i>11e-4/3e4</i>	.	.	MCS (Neum) [16]
NEWUOA	5.1	2.7	5	13	1.2	1.7	9.9	110	100	<i>70e-5/5e3</i>	NEWUOA [23]
(1+1)-ES	2.8	2.1	3.4	15	1.9	4.5	16	95	800	<i>18e-7/1e6</i>	(1+1)-ES [1]
PSO	1.8	2.1	8.1	9.5	1.6	4.6	89	360	970	<i>41e-5/1e5</i>	PSO [6]
PSO_Bounds	2.5	2.1	6.2	8.8	1.7	6.2	46	230	1100	<i>10e-5/1e5</i>	PSO_Bounds [7]
Monte Carlo	3.1	2.4	5.9	14	5.6	28	300	2800	9800	<i>17e-5/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	3.4	2.7	5.4	9.4	1.1	1	1	1.1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.9	2	2.9	10	2.5	7	62	58	<i>12e-3/3e3</i>	.	SNOBFIT [17]
VNS (Garcia)	9.5	3.9	9.2	14	1.3	1	1	1	1	1	VNS (Garcia) [10]

Table 13: 02-D, running time excess ERT/ERT_{best} on f_{113} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

113 Step-ellipsoid Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	1.07	2.37	15.7	43.7	69.8	87.1	87.1	87.1	438	ERT_{best}/D
ALPS	1	1.6	2.2	4.3	12	11	13	13	13	4.1	ALPS [15]
AMaLGaM IDEA	1.3	1.6	2.3	1.1	1	1	1	1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	2.1	13	9.5	6.1	9.7	19	33	33	33	13	avg NEWUOA [23]
BayEDAcG	1.3	1.3	2.4	2.3	30	26	69	69	69	20	BayEDAcG [9]
BFGS	26	24	81	91	260	<i>60e-2/3e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.1	4.1	5.1	6.4	13	14	12	12	12	2.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	40	21	12	7.4	11	17	19	19	19	4.4	(1+1)-CMA-ES [2]
DASA	9.5	120	220	180	380	600	770	770	770	380	DASA [18]
DEPSO	1.7	1.8	4.3	5.4	5.2	5.8	7.1	7.1	7.1	1.6	DEPSO [11]
EDA-PSO	1.7	1.9	2.5	2.5	6.8	19	25	25	25	7.3	EDA-PSO [5]
full NEWUOA	2.2	11	11	4.8	17	26	47	47	47	15	full NEWUOA [23]
GLOBAL	2	1.9	4.2	4.1	5.5	5.7	7.6	7.6	7.6	1.7	GLOBAL [20]
iAMaLGaM IDEA	1.6	1.6	2.9	1	20	13	10	10	10	2.1	iAMaLGaM IDEA [4]
MA-LS-Chain	1.1	1	2.6	2.6	5.6	7.2	9.9	9.9	9.9	2.3	MA-LS-Chain [19]
MCS (Neum)	1.4	1.3	1	1.2	6.1	37	76	76	76	57	MCS (Neum) [16]
NEWUOA	2.4	8.7	12	5.8	16	29	42	42	42	14	NEWUOA [23]
(1+1)-ES	9.3	10	13	5.7	6.4	8.9	15	15	15	3.7	(1+1)-ES [1]
PSO	1.4	1.8	4.7	2.6	3.6	5.1	5.9	5.9	5.9	1.6	PSO [6]
PSO_Bounds	1.2	1.6	3.4	2	4.3	11	13	13	13	5	PSO_Bounds [7]
Monte Carlo	1.6	1.6	2.9	4.7	18	54	160	160	160	130	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.8	3.3	4.2	13	32	27	27	27	27	5.3	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	1.8	4	10	20	20	20	20	5.1	SNOBFIT [17]
VNS (Garcia)	1	2.2	2.7	25	63	52	43	43	43	8.6	VNS (Garcia) [10]

Table 14: 02-D, running time excess ERT/ERT_{best} on f_{114} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

114 Step-ellipsoid unif												
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$	
ERT_{best}/D	0.5	0.833	4.43	21.3	349	1240	2670	2670	2670	4340	ERT_{best}/D	
ALPS	1.2	1	1.6	3.1	1.8	1.3	1	1	1	1	ALPS [15]	
AMaLGaM IDEA	1.2	1.8	1.8	1.5	6.1	3.1	2.8	2.8	2.8	2.8	AMaLGaM IDEA [4]	
avg NEWUOA	1.5	66	29	16	26	21	33	33	33	20	avg NEWUOA [23]	
BayEDAcG	1.5	1.9	2.1	38	37	23	<i>60e-2/2e3</i>	.	.	.	BayEDAcG [9]	
BFGS	8.8	18	9.6	7.2	6.9	<i>49e-2/800</i>	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	4.1	6.5	3.3	7.8	2.3	1.7	1.8	1.8	1.8	1.5	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1.2	27	19	8.1	6.2	4.5	4	4	4	7.9	(1+1)-CMA-ES [2]	
DASA	100	250	220	220	110	90	120	120	120	160	DASA [18]	
DEPSO	1.8	1.7	1.3	7.8	3.3	3.1	5.5	5.5	5.5	7	DEPSO [11]	
EDA-PSO	1.3	1.6	1.6	2.2	1.6	2	1.1	1.1	1.1	1	EDA-PSO [5]	
full NEWUOA	2.3	67	91	95	40	18	18	18	18	<i>11e-2/7e3</i>	full NEWUOA [23]	
GLOBAL	1.2	2.4	2.4	2.6	2	2.6	3.1	3.1	3.1	6.5	GLOBAL [20]	
iAMaLGaM IDEA	1.3	2.3	29	65	23	10	5.2	5.2	5.2	3.5	iAMaLGaM IDEA [4]	
MA-LS-Chain	1.2	1.5	1.9	2.8	1	1	1.2	1.2	1.2	1.3	MA-LS-Chain [19]	
MCS (Neum)	1.4	3.4	1.2	5.5	3.4	7	17	17	17	<i>38e-4/3e4</i>	MCS (Neum) [16]	
NEWUOA	1.9	41	69	53	38	71	33	33	33	<i>21e-2/6e3</i>	NEWUOA [23]	
(1+1)-ES	2.2	18	25	13	7.2	7	6.4	6.4	6.4	6.4	(1+1)-ES [1]	
PSO	1.3	1.8	1	1.8	23	22	12	12	12	7.4	PSO [6]	
PSO_Bounds	1.5	2.3	1	1	73	30	15	15	15	9.6	PSO_Bounds [7]	
Monte Carlo	1.5	1.7	1.2	1.6	1.9	4.3	4.7	4.7	4.7	20	Monte Carlo [3]	
IPOP-SEP-CMA-ES	2.1	10	15	29	4.6	5.3	3.7	3.7	3.7	3.1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1.7	2.7	1.5	3.8	2.6	2.5	2.9	2.9	2.9	2.6	SNOBFIT [17]	
VNS (Garcia)	1	2.9	1.4	91	12	7.9	6.1	6.1	6.1	4.1	VNS (Garcia) [10]	

Table 15: 02-D, running time excess ERT/ERT_{best} on f_{115} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

115 Step-ellipsoid Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	1.03	1.6	6.37	112	180	197	197	197	271	ERT_{best}/D
ALPS	1.3	2	2.7	11	4.4	6.6	10	10	10	16	ALPS [15]
AMaLGaM IDEA	1.3	1.3	2.5	3.1	7.5	4.8	4.4	4.4	4.4	11	AMaLGaM IDEA [4]
avg NEWUOA	1.5	2.8	6.5	7.3	2.9	6.1	7.1	7.1	7.1	12	avg NEWUOA [23]
BayEDAcG	1.4	1.1	7.4	31	28	160	140	140	140	100	BayEDAcG [9]
BFGS	13	23	92	140	200	<i>49e-2/2e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	3.4	3.5	4.9	4.7	1.2	2.2	2.6	2.6	2.6	2.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.7	2.7	5	14	2.4	4.2	16	16	16	25	(1+1)-CMA-ES [2]
DASA	16	39	140	420	110	230	580	580	580	1600	DASA [18]
DEPSO	1	1.4	5.4	9	1.6	3.4	3.9	3.9	3.9	4.3	DEPSO [11]
EDA-PSO	1.3	1.2	3.3	4.3	2.1	4.3	17	17	17	64	EDA-PSO [5]
full NEWUOA	1.7	2.5	3	7.1	1.8	2.9	8	8	8	9.3	full NEWUOA [23]
GLOBAL	1.9	1.9	4.7	6.6	1.9	3.1	4.6	4.6	4.6	13	GLOBAL [20]
iAMaLGaM IDEA	1.2	1.4	3.1	28	14	8.8	12	12	12	14	iAMaLGaM IDEA [4]
MA-LS-Chain	1.5	2	4.2	3.9	1.3	2.9	3.4	3.4	3.4	4.7	MA-LS-Chain [19]
MCS (Neum)	1.4	1.4	1	4.4	2.5	52	87	87	87	450	MCS (Neum) [16]
NEWUOA	2	2.5	4.5	12	2.9	4.4	11	11	11	11	NEWUOA [23]
(1+1)-ES	1.9	3.4	5.8	16	2.4	3.7	5.5	5.5	5.5	14	(1+1)-ES [1]
PSO	1.3	2.5	4.6	6.2	66	72	120	120	120	280	PSO [6]
PSO_Bounds	1.6	2.1	6.4	5.8	3	44	170	170	170	380	PSO_Bounds [7]
Monte Carlo	1.3	1	3	4.7	5.6	23	89	89	89	260	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.8	4.1	4.8	7.3	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.5	1.4	2.1	1	2.1	7.4	22	22	22	63	SNOBFIT [17]
VNS (Garcia)	1	2.3	3.9	26	2.1	1.6	1.7	1.7	1.7	1.4	VNS (Garcia) [10]

Table 16: 02-D, running time excess ERT/ERT_{best} on f_{116} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

116 Ellipsoid Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	3.27	6.77	24.6	50.3	77.6	103	138	165	521	894	ERT_{best}/D
ALPS	1.8	3.1	3.6	14	23	33	45	56	30	27	ALPS [15]
AMaLGaM IDEA	1.7	1.6	1.2	1	1	1	1	1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	7.9	6.2	12	15	32	98	130	480	<i>14e-3/5e3</i>	.	avg NEWUOA [23]
BayEDAcG	2.8	5.2	9.7	63	110	280	<i>28e-1/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	30	35	60	410	<i>53e-1/1e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.9	9.4	15	61	62	51	39	33	11	6.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.7	1.7	8.1	11	29	49	110	420	270	160	(1+1)-CMA-ES [2]
DASA	48	47	43	130	500	1e3	1900	1.3e4	1.8e4	<i>29e-5/7e5</i>	DASA [18]
DEPSO	1.4	4.2	6.8	13	15	24	31	41	18	16	DEPSO [11]
EDA-PSO	1.9	3.6	5.1	18	30	46	64	76	29	27	EDA-PSO [5]
full NEWUOA	8.3	15	11	17	44	110	320	<i>11e-3/6e3</i>	.	.	full NEWUOA [23]
GLOBAL	1.4	4.1	3.5	8.3	12	37	28	31	9.8	18	GLOBAL [20]
iAMaLGaM IDEA	1.2	1.8	6.7	24	23	19	14	12	4.1	2.5	iAMaLGaM IDEA [4]
MA-LS-Chain	2.4	3.7	3.3	11	23	43	49	51	22	15	MA-LS-Chain [19]
MCS (Neum)	1	1	1	13	86	730	<i>24e-3/3e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	5.4	4.6	6.3	18	38	110	570	<i>50e-3/5e3</i>	.	.	NEWUOA [23]
(1+1)-ES	5.9	3.7	3.2	12	20	64	130	500	350	1500	(1+1)-ES [1]
PSO	2.3	3.7	5.9	35	120	100	84	79	28	20	PSO [6]
PSO_Bounds	3.4	3	13	410	280	230	190	180	82	63	PSO_Bounds [7]
Monte Carlo	2	2.5	5.5	29	280	2700	9200	4.1e4	<i>80e-5/1e6</i>	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	11	8.1	17	40	41	32	24	20	6.5	3.9	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.7	1.6	5	8.9	48	100	120	<i>12e-2/3e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	1.8	4	67	75	55	50	39	35	13	16	VNS (Garcia) [10]

Table 17: 02-D, running time excess ERT/ERT_{best} on f_{117} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

117 Ellipsoid unif											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	4.77	17.4	83.7	673	3230	6960	14100	14900	18200	21600	ERT_{best}/D
ALPS	1.6	1.8	1.6	1.1	1.1	1	1.3	2.4	2.8	7.9	ALPS [15]
AMaLGaM IDEA	1.7	1.3	4.9	9.9	4.5	4.6	2.6	2.5	2.9	4.1	AMaLGaM IDEA [4]
avg NEWUOA	15	32	24	10	8.4	<i>78e-2/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	2.4	2.6	17	42	<i>78e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	8.6	5.3	4.9	6.2	2.7	<i>40e-1/600</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	2.2	5.4	6.7	3.8	2.1	1.6	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	9.5	4.5	5	1.8	2.1	10	10	<i>32e-3/1e4</i>	.	.	(1+1)-CMA-ES [2]
DASA	90	80	58	51	46	120	310	<i>71e-4/6e5</i>	.	.	DASA [18]
DEPSO	1	4.1	3.6	1.9	4.1	<i>46e-2/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1.3	2.6	1.2	6	2.4	2.5	4.6	9.6	17	21	EDA-PSO [5]
full NEWUOA	55	41	25	14	31	14	<i>87e-2/7e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	1.4	1	2.3	1.3	1.9	1.8	<i>25e-2/2e3</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	43	12	11	5.7	4.5	3.4	2	2.5	3.3	6.5	iAMaLGaM IDEA [4]
MA-LS-Chain	1.3	1.1	1.2	1	1	1.7	1.9	12	<i>27e-4/1e4</i>	.	MA-LS-Chain [19]
MCS (Neum)	1.4	1.2	1	1.4	4.2	8.4	<i>27e-3/3e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	43	25	29	12	26	<i>97e-2/6e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	3.1	6	6.2	2.3	1.9	4	8.2	46	97	660	(1+1)-ES [1]
PSO	1.4	1.3	4.6	55	12	13	11	16	24	66	PSO [6]
PSO_Bounds	2.2	1.1	1.6	55	21	17	21	45	37	67	PSO_Bounds [7]
Monte Carlo	1.5	1	2.8	3.2	4.4	31	120	940	<i>10e-4/1e6</i>	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	22	27	10	5.3	2.8	1.9	1.2	1.9	4	<i>39e-4/1e4</i>	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.1	1.2	3.5	2.6	5.1	2.5	<i>51e-2/3e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	1.3	1.3	41	11	5.6	4.5	3.8	12	29	410	VNS (Garcia) [10]

Table 18: 02-D, running time excess ERT/ERT_{best} on f_{118} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

118 Ellipsoid Cauchy											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	2.1	2.5	10.5	51.5	66.2	252	292	326	388	486	ERT_{best}/D
ALPS	6.3	9.9	12	13	20	12	60	630	2400	<i>44e-7/2e6</i>	ALPS [15]
AMaLGaM IDEA	4.4	7.2	3	1	1	1.6	4	6.2	14	20	AMaLGaM IDEA [4]
avg NEWUOA	2.4	2.3	2.8	3.8	12	9	21	220	<i>90e-5/5e3</i>	.	avg NEWUOA [23]
BayEDAcG	3.1	7.7	5.9	28	66	110	<i>71e-2/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	17	20	17	16	59	49	42	54	45	56	BFGS [22]
BIPOP-CMA-ES	3.5	5.7	15	7.7	7.4	2.4	2.2	2.3	2.1	1.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.8	6.9	18	11	21	12	45	460	<i>98e-5/1e4</i>	.	(1+1)-CMA-ES [2]
DASA	16	19	130	110	240	120	1300	1.5e4	<i>43e-5/7e5</i>	.	DASA [18]
DEPSO	5.4	11	14	15	29	13	19	92	<i>30e-3/2e3</i>	.	DEPSO [11]
EDA-PSO	2.8	5.1	9	15	41	49	190	510	1800	<i>12e-5/1e5</i>	EDA-PSO [5]
full NEWUOA	2.3	2.6	2.3	2.8	7.3	3.5	7.5	60	220	<i>40e-5/6e3</i>	full NEWUOA [23]
GLOBAL	3.6	7.8	9.5	3.6	3.1	1.5	2.8	4.1	4.9	<i>64e-6/800</i>	GLOBAL [20]
iAMaLGaM IDEA	3.1	5.4	2.3	3.4	8.8	5	8.5	9.7	14	34	iAMaLGaM IDEA [4]
MA-LS-Chain	5.7	7.9	6.9	6.2	7.6	2.6	2.7	3	3.8	3.9	MA-LS-Chain [19]
MCS (Neum)	1	1	1.3	1.3	41	38	150	1100	<i>27e-4/3e4</i>	.	MCS (Neum) [16]
NEWUOA	2.1	2.6	5.6	4.2	11	10	35	71	190	<i>11e-4/5e3</i>	NEWUOA [23]
(1+1)-ES	3.6	7.8	17	19	41	43	140	1200	5400	<i>12e-6/1e6</i>	(1+1)-ES [1]
PSO	2.1	5	9.5	9.4	42	80	200	650	1200	<i>33e-5/1e5</i>	PSO [6]
PSO_Bounds	3.2	7.7	12	150	140	180	370	2200	<i>88e-5/1e5</i>	.	PSO_Bounds [7]
Monte Carlo	2.6	8.4	14	46	250	340	3500	<i>64e-5/1e6</i>	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	4.1	9.3	17	6.2	6	1.9	1.7	1.6	1.4	1.3	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.7	2.2	1	1	4.1	6.7	19	110	95	<i>32e-4/3e3</i>	SNOBFIT [17]
VNS (Garcia)	2.9	9.1	14	3.7	3.4	1	1	1	1	1	VNS (Garcia) [10]

Table 19: 02-D, running time excess ERT/ERT_{best} on f_{119} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

119 Sum of different powers Gauss											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	0.5	0.5	0.7	5.37	35.5	88	520	950	2380	5040	ERT_{best}/D
ALPS	1	1.5	1.6	1.8	2.9	7	3	2.9	1.9	8.5	ALPS [15]
AMaLGaM IDEA	1	1	1.7	78	13	12	3.3	2.5	1.2	1	AMaLGaM IDEA [4]
avg NEWUOA	1	1.4	2.9	18	8	14	5.9	6.6	6.8	<i>67e-6/5e3</i>	avg NEWUOA [23]
BayEDAcG	1	1.3	1.4	6.3	4.4	4	2.1	4.4	3.9	<i>18e-5/2e3</i>	BayEDAcG [9]
BFGS	1	12	43	58	160	570	<i>13e-2/4e3</i>	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	2.3	3.8	2.9	1.2	1	1.6	3	2	3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.5	12	7.9	7.2	1.6	3	2.4	6.6	(1+1)-CMA-ES [2]
DASA	1	1	91	280	170	360	200	330	600	1800	DASA [18]
DEPSO	1	1	1.6	2.5	3.6	3.7	1	1	1	<i>79e-7/2e3</i>	DEPSO [11]
EDA-PSO	1	1.3	1.2	2.3	2.6	4.9	3.1	4.4	2.9	32	EDA-PSO [5]
full NEWUOA	1	1.6	3.2	8.7	4.8	13	11	15	38	<i>32e-5/6e3</i>	full NEWUOA [23]
GLOBAL	1	1.3	1.6	2.3	4.1	4.3	1.6	2.2	2	<i>32e-5/700</i>	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	1.4	2.1	7.8	12	4.5	3	2.1	1.6	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.2	1.7	2.6	2.6	4.3	1.4	1.3	1	2.1	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1.2	40	150	<i>18e-4/3e4</i>	.	.	MCS (Neum) [16]
NEWUOA	1	2.6	3.1	15	8.6	23	7.1	19	33	15	NEWUOA [23]
(1+1)-ES	1	2	11	22	7.3	3.6	1.1	3.1	3.3	11	(1+1)-ES [1]
PSO	1	1.1	2	3	2.5	3.5	1.5	1.3	4.4	47	PSO [6]
PSO_Bounds	1	1.1	2	2	3.3	5.5	3.6	4.1	4	45	PSO_Bounds [7]
Monte Carlo	1	1.4	1.7	2.1	6.8	77	380	2500	<i>18e-5/1e6</i>	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.2	1.7	2.2	1	3.8	1.3	2.8	1.7	1.2	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.3	1.9	1.3	3.2	4	2.7	4	2.6	7.4	SNOBFIT [17]
VNS (Garcia)	1	1	2.1	4.2	2.8	1.8	2.5	2.9	2.4	6.6	VNS (Garcia) [10]

Table 20: 02-D, running time excess ERT/ERT_{best} on f_{120} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

120 Sum of different powers unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.7	5.67	187	1260	2860	13000	37700	94300	ERT_{best}/D
ALPS	1	1.1	1.9	1.1	2	1.2	2	1	1.3	6.1	ALPS [15]
AMaLGaM IDEA	1	1.3	1.2	1.3	6.4	7.3	9.7	7.1	6.9	21	AMaLGaM IDEA [4]
avg NEWUOA	1	9.5	37	74	42	15	<i>94e-3/6e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.1	3.1	22	<i>21e-2/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	1	2	7.6	20	14	9.5	<i>13e-2/800</i>	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	2	4.4	11	2.3	1.1	1	1.2	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.1	2.6	13	3.4	9	52	<i>57e-4/1e4</i>	.	.	(1+1)-CMA-ES [2]
DASA	1	72	86	310	61	73	310	210	230	<i>89e-5/6e5</i>	DASA [18]
DEPSO	1	1	1.5	3.2	2.2	4	<i>14e-3/2e3</i>	.	.	.	DEPSO [11]
EDA-PSO	1	1.2	1.8	1	1.1	1.4	3	2.3	4.2	<i>10e-6/1e5</i>	EDA-PSO [5]
full NEWUOA	1	20	48	77	17	76	<i>44e-3/7e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	1	1.1	1.5	2.1	1.1	3.8	<i>13e-3/2e3</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.2	1.3	57	26	14	15	14	17	160	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.2	1.6	2.2	1	1	1.8	1.1	3.9	<i>99e-6/1e4</i>	MA-LS-Chain [19]
MCS (Neum)	1	1	1	3.8	3.1	14	41	<i>38e-4/3e4</i>	.	.	MCS (Neum) [16]
NEWUOA	1	3.1	48	61	41	34	<i>98e-3/6e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	1	2	11	25	4.8	5.3	10	22	22	<i>50e-7/1e6</i>	(1+1)-ES [1]
PSO	1	1.3	2	2.4	39	7	5.8	3.1	4.2	<i>12e-6/1e5</i>	PSO [6]
PSO_Bounds	1	1.3	1.4	3	1.1	7	6.5	5.8	4.9	<i>29e-6/1e5</i>	PSO_Bounds [7]
Monte Carlo	1	1.3	1.5	2.2	2.2	5.9	26	250	<i>16e-5/1e6</i>	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.3	3	35	14	5.1	5	11	<i>36e-5/1e4</i>	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.3	1.7	2.6	2	3.9	<i>19e-3/3e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.1	4	20	5.9	4.9	3.3	8.1	260	VNS (Garcia) [10]

Table 21: 02-D, running time excess ERT/ERT_{best} on f_{121} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

$\Delta\text{ftarget}$ ERT_{best}/D	121 Sum of different powers Cauchy										$\Delta\text{ftarget}$ ERT_{best}/D
	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	
ALPS	1	1.4	2	5	9.5	18	90	680	3500	<i>50e-7/2e6</i>	ALPS [15]
AMaLGaM IDEA	1	1.1	1.4	2.7	1.4	22	30	29	38	160	AMaLGaM IDEA [4]
avg NEWUOA	1	1.6	2.6	5.7	4.4	6.3	22	35	<i>31e-5/5e3</i>	.	avg NEWUOA [23]
BayEDAcG	1	1.1	1.3	4.7	9.8	4.8	4.7	10	53	<i>28e-5/2e3</i>	BayEDAcG [9]
BFGS	1	9.6	22	34	16	15	27	46	48	<i>78e-5/4e3</i>	BFGS [22]
BIPOP-CMA-ES	1	1.5	3.1	3.5	1.4	1	1.3	1.4	2	2.6	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.2	3.4	7.9	14	21	61	190	<i>62e-5/1e4</i>	.	(1+1)-CMA-ES [2]
DASA	1	14	160	270	230	880	5500	<i>12e-4/6e5</i>	.	.	DASA [18]
DEPSO	1	1.6	2.2	4.2	5.1	4.1	5.4	77	<i>38e-5/2e3</i>	.	DEPSO [11]
EDA-PSO	1	1	1.6	4	3.2	15	180	1800	<i>55e-5/1e5</i>	.	EDA-PSO [5]
full NEWUOA	1	2.1	4	1.6	1.7	1.5	8.9	15	25	<i>34e-6/5e3</i>	full NEWUOA [23]
GLOBAL	1	1.3	1.8	2.6	7.6	5.2	10	21	<i>59e-5/2e3</i>	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.4	1.7	2.2	15	11	25	32	64	250	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1.6	4.5	4	4.1	4.4	4.2	7.1	38	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	99	510	<i>23e-4/3e4</i>	.	.	MCS (Neum) [16]
NEWUOA	1	1.6	2.7	4.4	3	7.6	14	57	120	<i>40e-5/5e3</i>	NEWUOA [23]
(1+1)-ES	1	1.6	3.2	4.8	4.3	9.8	58	320	5500	<i>16e-6/1e6</i>	(1+1)-ES [1]
PSO	1	1.3	1.6	3.3	6.2	89	310	1900	2500	<i>32e-5/1e5</i>	PSO [6]
PSO_Bounds	1	1.2	2.2	3	7.4	240	400	410	1200	<i>21e-5/1e5</i>	PSO_Bounds [7]
Monte Carlo	1	1.3	1.6	2.6	9.4	70	830	1.3e4	2.7e4	<i>27e-5/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.2	3	5.2	1.8	1.1	1	1	1.2	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	1.9	1.9	2.2	11	73	<i>24e-4/3e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.1	6.5	4.1	1.7	1.6	1.1	1	1.1	VNS (Garcia) [10]

Table 22: 02-D, running time excess ERT/ERT_{best} on f_{122} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

122 Schaffer F7 Gauss											
Δ ftarget	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δ ftarget
ERT_{best}/D	0.5	0.5	1.47	47.7	261	705	1120	1680	2180	4780	ERT_{best}/D
ALPS	1	1.2	2	2.9	4.4	4	4.3	3.9	4.1	3.3	ALPS [15]
AMaLGaM IDEA	1	1.1	2.5	14	6.6	4.8	3.7	2.9	2.9	1.9	AMaLGaM IDEA [4]
avg NEWUOA	1	1.3	14	9.7	33	55	<i>11e-2/5e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	1.1	1.1	1.7	3.2	3.4	9.7	<i>16e-3/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	1	3.8	46	40	<i>47e-2/3e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.2	2.8	2	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.9	16	5.1	9.2	9.3	60	<i>48e-4/1e4</i>	.	.	(1+1)-CMA-ES [2]
DASA	1	30	320	170	300	960	7700	<i>87e-4/6e5</i>	.	.	DASA [18]
DEPSO	1	1.3	1	2.6	2	1.5	1.9	2.1	6.9	<i>57e-6/2e3</i>	DEPSO [11]
EDA-PSO	1	1.6	2.8	1.2	8.9	8.6	9.7	8.7	9	5.7	EDA-PSO [5]
full NEWUOA	1	1.4	11	7	20	62	<i>59e-3/6e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.8	1.7	3.3	<i>64e-3/1e3</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.3	1.7	19	6.6	7.8	7.5	6.3	6	3.8	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.4	1.7	2.1	3.6	3.1	2.7	2.4	2.7	3	MA-LS-Chain [19]
MCS (Neum)	1	1	1.4	1	23	240	<i>18e-3/3e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.7	9.7	16	30	54	<i>99e-3/5e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	1.1	40	21	3.5	7.2	16	65	570	2100	<i>29e-6/1e6</i>	(1+1)-ES [1]
PSO	1	1.1	2.2	3.5	11	7	5.6	4.8	4.8	3.1	PSO [6]
PSO_Bounds	1	1.1	1.7	1.3	3.6	6.1	6.9	6.2	7.8	6.5	PSO_Bounds [7]
Monte Carlo	1	1	2.4	2.9	58	1400	<i>79e-4/1e6</i>	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	2.3	3.9	15	5	2.4	2.5	2	1.6	1.2	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.3	1.8	2.5	3.2	3.1	6.1	<i>75e-4/3e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.2	27	15	6.9	6.1	6.9	16	59	VNS (Garcia) [10]

Table 23: 02-D, running time excess ERT/ERT_{best} on f_{123} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

123 Schaffer F7 unif												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.5	0.5	1.57	106	3190	12400	19400	28300	5e4	1.09e5	ERT_{best}/D	
ALPS	1	1.1	1.6	1.2	1	1.6	7.6	40	340	<i>29e-6/2e6</i>	ALPS [15]	
AMaLGaM IDEA	1	1.3	1.7	22	6	13	50	240	<i>98e-5/1e6</i>	.	AMaLGaM IDEA [4]	
avg NEWUOA	1	9.5	66	24	28	<i>46e-2/6e3</i>	.	.	.	.	avg NEWUOA [23]	
BayEDAcG	1	1.5	2.6	23	<i>10e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]	
BFGS	1	1	6.4	7.1	<i>53e-2/800</i>	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	1	1.1	52	5.2	1.2	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	1.9	20	7.7	9.9	5.8	<i>16e-2/1e4</i>	.	.	.	(1+1)-CMA-ES [2]	
DASA	1	4.1	130	77	52	<i>40e-3/6e5</i>	.	.	.	.	DASA [18]	
DEPSO	1	1.2	1.7	2.7	2.1	<i>19e-2/2e3</i>	.	.	.	.	DEPSO [11]	
EDA-PSO	1	1.1	1.6	1.4	1.2	6.5	<i>81e-4/1e5</i>	.	.	.	EDA-PSO [5]	
full NEWUOA	1.1	11	73	27	31	<i>36e-2/7e3</i>	.	.	.	.	full NEWUOA [23]	
GLOBAL	1	1.4	1.7	1.3	1.4	<i>16e-2/2e3</i>	.	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	1.1	1.4	2.1	57	7.6	25	130	520	300	<i>11e-4/1e6</i>	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1.3	2.3	1.2	1.2	12	<i>32e-3/1e4</i>	.	.	.	MA-LS-Chain [19]	
MCS (Neum)	1	1	1	1.8	8.7	<i>58e-3/3e4</i>	.	.	.	.	MCS (Neum) [16]	
NEWUOA	1	1	56	32	28	<i>44e-2/6e3</i>	.	.	.	.	NEWUOA [23]	
(1+1)-ES	1	2.5	66	8.7	4.9	38	350	<i>57e-4/1e6</i>	.	.	(1+1)-ES [1]	
PSO	1.1	1.1	2.4	3.2	3.9	7	36	51	<i>58e-4/1e5</i>	.	PSO [6]	
PSO_Bounds	1.1	1.3	2.3	1.2	5.9	6.1	36	26	<i>47e-4/1e5</i>	.	PSO_Bounds [7]	
Monte Carlo	1	1.2	1.8	1	5.3	160	<i>12e-3/1e6</i>	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	1.3	74	23	4.7	<i>92e-3/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1.4	1.2	3	2.6	2.9	1.9	<i>21e-2/3e3</i>	.	.	SNOBFIT [17]	
VNS (Garcia)	1	1	2.1	46	5.1	5.7	45	930	<i>21e-5/1e7</i>	.	VNS (Garcia) [10]	

Table 24: 02-D, running time excess ERT/ERT_{best} on f_{124} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

124 Schaffer F7 Cauchy												
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$	
ERT_{best}/D	0.5	0.5	1.77	31.8	158	340	996	1740	2800	4510	ERT_{best}/D	
ALPS	1.1	1.4	1.5	2.5	5.8	170	3900	<i>10e-4/2e6</i>	.	.	ALPS [15]	
AMaLGaM IDEA	1	1.1	1.4	11	8.3	12	23	28	44	450	AMaLGaM IDEA [4]	
avg NEWUOA	1	1.7	12	9.3	22	61	<i>98e-3/5e3</i>	.	.	.	avg NEWUOA [23]	
BayEDAcG	1	1.3	1.6	3.3	2.8	2.9	9.4	<i>15e-4/2e3</i>	.	.	BayEDAcG [9]	
BFGS	1	17	48	78	<i>53e-2/4e3</i>	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	1	1.4	3.3	3	1	1	1	1.1	1.5	3.1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	2.7	1.9	4.9	5.7	88	140	<i>17e-3/1e4</i>	.	.	(1+1)-CMA-ES [2]	
DASA	1.6	6	110	170	770	<i>32e-3/6e5</i>	.	.	.	.	DASA [18]	
DEPSO	1	1.1	1.4	4	4.2	8.9	<i>79e-4/2e3</i>	.	.	.	DEPSO [11]	
EDA-PSO	1	1.1	1	2	9.2	1300	<i>18e-3/1e5</i>	.	.	.	EDA-PSO [5]	
full NEWUOA	1	1.8	2.5	5.4	9.1	49	<i>17e-3/5e3</i>	.	.	.	full NEWUOA [23]	
GLOBAL	1	1	1.2	2.8	6.7	24	<i>98e-3/1e3</i>	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	1.1	1.3	1.9	5.6	9.5	23	30	41	110	670	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1.3	2	2.1	2.6	42	140	<i>14e-3/1e4</i>	.	.	MA-LS-Chain [19]	
MCS (Neum)	1	1	1	1	95	<i>68e-3/3e4</i>	.	.	.	.	MCS (Neum) [16]	
NEWUOA	1	2.2	5.6	6.5	14	46	<i>33e-3/5e3</i>	.	.	.	NEWUOA [23]	
(1+1)-ES	1.1	1.6	10	5.6	6	36	2e3	<i>10e-4/1e6</i>	.	.	(1+1)-ES [1]	
PSO	1	1.3	1.3	1.8	13	560	470	<i>13e-3/1e5</i>	.	.	PSO [6]	
PSO_Bounds	1	1.3	1.4	1.8	110	430	<i>14e-3/1e5</i>	.	.	.	PSO_Bounds [7]	
Monte Carlo	1	1.1	1.4	5.9	84	2900	1.5e4	<i>78e-4/1e6</i>	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	1.1	4.9	2.2	1.5	1.6	1.3	1	1	1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1.3	2.1	3.5	8.2	110	<i>32e-3/3e3</i>	.	.	.	SNOBFIT [17]	
VNS (Garcia)	1	1	1.9	26	13	22	21	30	220	340	VNS (Garcia) [10]	

Table 25: 02-D, running time excess ERT/ERT_{best} on f_{125} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

125 Griewank-Rosenbrock Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.5	0.5	0.5	74.3	575	1230	1930	3780	ERT_{best}/D
ALPS	1	1	1	4.3	77	3.6	1.5	1.3	1.6	1.6	ALPS [15]
AMaLGaM IDEA	1	1	1.1	3.3	38	1	13	7.7	5.5	2.9	AMaLGaM IDEA [4]
avg NEWUOA	1	1	2.3	6.9	46	1.8	2.7	2.4	2.3	6.2	avg NEWUOA [23]
BayEDAcG	1	1	1.3	5.5	32	1.5	1	2	3.4	<i>49e-6/2e3</i>	BayEDAcG [9]
BFGS	1	1	11	87	730	40	49	46	<i>59e-4/4e3</i>	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.1	5.1	34	1.9	3	2.2	1.9	1.3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	3.5	84	4	4.4	2.9	4	3.2	(1+1)-CMA-ES [2]
DASA	1	1	3.9	280	2400	64	91	89	120	220	DASA [18]
DEPSO	1	1	1.6	5.6	120	2.5	1.7	1	1	1	DEPSO [11]
EDA-PSO	1	1	1.2	3.9	52	1.4	1.9	1.9	2.4	2.1	EDA-PSO [5]
full NEWUOA	1	1	1.8	7.3	66	2.5	3.5	2.8	2.7	12	full NEWUOA [23]
GLOBAL	1	1	1.1	4.7	56	2.3	1.4	1	1.5	1.4	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.2	4.7	500	13	20	11	7.2	4.2	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.2	5.6	44	2	4	2.3	2.1	1.9	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	1.2	8	10	13	15	MCS (Neum) [16]
NEWUOA	1	1	2	6.1	77	1.4	2.6	2.1	2.6	10	NEWUOA [23]
(1+1)-ES	1	1	3	22	130	5.5	4.2	3.7	3	6.5	(1+1)-ES [1]
PSO	1	1	1.1	5.1	43	2.2	7.4	5.8	6.1	3.5	PSO [6]
PSO_Bounds	1	1	1.3	4	32	1.6	2.5	2.5	1.8	2.2	PSO_Bounds [7]
Monte Carlo	1	1	1.1	4.1	53	3.2	4.4	6.5	12	160	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	2.7	200	4.3	5.4	3.6	3.3	2.4	IPOP-SEP-CMA-ES [21]
SNObFIT	1	1	1.2	4.9	31	4.2	4.3	2.9	2.4	1.6	SNObFIT [17]
VNS (Garcia)	1	1	1.2	2.2	44	1.7	9.3	5.9	4	2.4	VNS (Garcia) [10]

Table 26: 02-D, running time excess ERT/ERT_{best} on f_{126} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

126 Griewank-Rosenbrock unif											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	0.5	0.5	0.5	0.5	0.5	151	1710	3410	5530	18200	ERT_{best}/D
ALPS	1	1	1	4.6	47	1.3	1.6	1.2	2	1.4	ALPS [15]
AMaLGaM IDEA	1	1	1.1	5	41	8.3	10	7.1	9.1	5.3	AMaLGaM IDEA [4]
avg NEWUOA	1	1	26	95	670	15	11	7.8	<i>18e-4/6e3</i>	.	avg NEWUOA [23]
BayEDAcG	1	1	1.1	3.6	340	37	7.6	8.2	5.1	<i>26e-3/2e3</i>	BayEDAcG [9]
BFGS	1	1	2	17	170	7.7	<i>95e-4/900</i>	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	4.8	42	1.4	1.5	2	2.6	2.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.1	2.8	230	1.9	3.9	7.4	6.2	<i>27e-5/1e4</i>	(1+1)-CMA-ES [2]
DASA	1	1	3.7	420	3400	50	59	60	68	79	DASA [18]
DEPSO	1	1	1.2	4.7	64	3.6	3.3	4.2	2.6	1.6	DEPSO [11]
EDA-PSO	1	1	1.2	3.5	33	1.2	1.5	2.2	2.8	3.2	EDA-PSO [5]
full NEWUOA	1	1	19	130	560	8.9	17	<i>27e-4/7e3</i>	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	3.7	57	1.7	2.4	1.3	1.5	<i>17e-4/2e3</i>	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.1	4.7	960	20	9.8	10	14	8.4	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.3	6.3	53	1.3	1	1	1	1	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	1.6	3.4	4.3	7.1	<i>19e-6/3e4</i>	MCS (Neum) [16]
NEWUOA	1	1	2.1	200	600	15	52	<i>32e-4/6e3</i>	.	.	NEWUOA [23]
(1+1)-ES	1	1	2.1	39	230	2.5	4.7	6.8	8.3	8	(1+1)-ES [1]
PSO	1	1	1.3	5.2	57	1.2	11	7.8	6.9	4.2	PSO [6]
PSO_Bounds	1	1	1.1	6.7	51	1	4.6	4.4	4.1	2.6	PSO_Bounds [7]
Monte Carlo	1	1	1	2.9	31	1.8	1.6	2.4	4.2	13	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1.1	18	590	7.8	7.4	6.6	5	8.2	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.3	6.9	56	5.9	10	5	3.1	2	SNOBFIT [17]
VNS (Garcia)	1	1	1.2	2.2	67	17	7	6.4	5.4	5.4	VNS (Garcia) [10]

Table 27: 02-D, running time excess ERT/ERT_{best} on f_{127} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	127 Griewank-Rosenbrock Cauchy										
$\Delta\text{ftarget}$ ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$ ERT_{best}/D
	0.5	0.5	0.5	0.5	0.5	93	593	2010	3390	3640	
ALPS	1	1	1.1	6.3	43	2	3.7	4	7.1	90	ALPS [15]
AMaLGaM IDEA	1	1	1.3	4.7	28	11	16	8.4	9.6	17	AMaLGaM IDEA [4]
avg NEWUOA	1	1	1.3	7.2	72	1.6	3.5	1.8	2.5	<i>16e-6/5e3</i>	avg NEWUOA [23]
BayEDAcG	1	1	1.1	6.1	50	1	1	1	4.1	<i>62e-6/2e3</i>	BayEDAcG [9]
BFGS	1	1	5.2	54	580	15	45	27	<i>16e-4/4e3</i>	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.1	5.3	32	1.9	2.8	2	1.7	2.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.1	6.5	140	5.1	12	8.4	14	<i>25e-5/1e4</i>	(1+1)-CMA-ES [2]
DASA	1	1	14	170	2200	86	210	130	440	2400	DASA [18]
DEPSO	1	1	1.3	3.1	27	1.7	1.6	2.1	2	4	DEPSO [11]
EDA-PSO	1	1	1.3	3.7	40	2.1	6.4	7.9	12	120	EDA-PSO [5]
full NEWUOA	1	1	1.4	13	84	2	5.3	3.7	7.2	22	full NEWUOA [23]
GLOBAL	1	1	1.3	5.7	66	2.4	7.7	<i>16e-4/2e3</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.1	2.8	27	7.9	10	11	13	38	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	7.3	44	1.3	3.3	1.9	3.2	20	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	3.2	5.6	5.8	6.4	<i>42e-7/3e4</i>	MCS (Neum) [16]
NEWUOA	1	1	2.1	6.2	95	1.8	4.9	3.8	2.8	9	NEWUOA [23]
(1+1)-ES	1	1	1.9	6.3	64	2.2	7.1	5.4	8.4	88	(1+1)-ES [1]
PSO	1	1	1.4	4.3	35	2.2	30	19	16	86	PSO [6]
PSO_Bounds	1	1	1	7.5	44	1.4	89	47	37	130	PSO_Bounds [7]
Monte Carlo	1	1	1.1	4.4	56	2.7	6.1	4.9	11	110	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1.1	4.9	47	2.8	3.7	1.6	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1	4.7	36	3.8	11	5.5	11	10	SNOBFIT [17]
VNS (Garcia)	1	1	1.2	2.2	48	7.5	26	12	8	12	VNS (Garcia) [10]

Table 28: 02-D, running time excess ERT/ERT_{best} on f_{128} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

128 Gallagher Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.9	20.7	67.2	157	194	205	297	310	ERT_{best}/D
ALPS	1	1	1.3	2.2	2.2	2.3	2.7	4.9	4.5	6.2	ALPS [15]
AMaLGaM IDEA	1	1	1	47	32	14	12	13	9	9.9	AMaLGaM IDEA [4]
avg NEWUOA	1	1	2.9	21	9.3	7.9	7.4	8.7	9.7	32	avg NEWUOA [23]
BayEDAcG	1	1	1.1	4.8	3.4	5.2	11	14	18	45	BayEDAcG [9]
BFGS	1	1	12	65	59	60	270	<i>20e-3/4e3</i>	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.3	7.8	8.4	5.1	7.9	7.7	5.4	5.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.9	16	6.7	3	2.5	2.6	1.8	2	(1+1)-CMA-ES [2]
DASA	1	1	50	170	140	72	75	100	180	400	DASA [18]
DEPSO	1	1	1	3.9	4.4	2.4	2.2	2.4	1.9	2.4	DEPSO [11]
EDA-PSO	1	1	1.1	3.5	2.2	1.7	2.6	4.9	4.6	5.8	EDA-PSO [5]
full NEWUOA	1	1	3.1	21	13	10	10	13	11	15	full NEWUOA [23]
GLOBAL	1	1	1.5	1	1	1	1	1	1	1	GLOBAL [20]
iAMaLGaM IDEA	1	1	1	110	79	41	33	32	22	21	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.7	1.5	2.1	1.8	3.2	3.7	3	3.2	MA-LS-Chain [19]
MCS (Neum)	1	1	1.4	2.1	1.9	1.1	1.1	1.9	8.8	82	MCS (Neum) [16]
NEWUOA	1	1	1.9	17	9.5	9.8	9.8	16	14	20	NEWUOA [23]
(1+1)-ES	1	1	1.8	11	7.5	3.7	3.7	3.5	2.7	3.4	(1+1)-ES [1]
PSO	1	1	1.5	2.4	1.6	1.2	1.2	1.5	1.5	2.3	PSO [6]
PSO_Bounds	1	1	1.3	1.9	110	46	38	38	28	29	PSO_Bounds [7]
Monte Carlo	1	1	1.1	1.4	1.8	3.2	8.8	24	31	540	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	28	41	21	17	18	14	14	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.9	4.7	3.3	3	2.8	4.4	3.6	5.6	SNOBFIT [17]
VNS (Garcia)	1	1	1	73	59	29	25	24	17	16	VNS (Garcia) [10]

Table 29: 02-D, running time excess ERT/ERT_{best} on f_{129} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

129 Gallagher unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.9	32.7	110	261	951	1620	2970	5330	ERT_{best}/D
ALPS	1	1	1.1	1.1	1.5	1.9	1.4	1.5	1.2	1.2	ALPS [15]
AMaLGaM IDEA	1	1	1.4	57	48	41	14	14	9.8	6.1	AMaLGaM IDEA [4]
avg NEWUOA	1	1	52	25	31	27	9.4	25	29	16	avg NEWUOA [23]
BayEDAcG	1	1	1.3	5.9	21	21	30	17	<i>16e-2/2e3</i>	.	BayEDAcG [9]
BFGS	1	1	8	5.2	5.4	15	13	<i>39e-3/800</i>	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.8	12	5.4	4.4	3.1	3.5	2.5	1.7	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.2	10	7.2	7.7	3.1	2.4	2.4	6.3	(1+1)-CMA-ES [2]
DASA	1	1	18	87	120	80	36	40	48	130	DASA [18]
DEPSO	1	1	1.3	3.8	4.1	3.3	2.6	5.5	<i>93e-5/2e3</i>	.	DEPSO [11]
EDA-PSO	1	1	1.2	1.8	1	1	1	1.4	1.2	1	EDA-PSO [5]
full NEWUOA	1	1	32	38	18	59	22	18	32	<i>14e-3/7e3</i>	full NEWUOA [23]
GLOBAL	1	1	1.5	1	1.2	2	1.2	1.1	1	5.1	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.1	56	30	31	11	12	9.3	5.8	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.2	1	1.2	1.9	1.9	1.8	1.5	1.7	MA-LS-Chain [19]
MCS (Neum)	1	1	1.6	3.2	2.1	2.9	2.1	4.8	7.7	<i>27e-7/3e4</i>	MCS (Neum) [16]
NEWUOA	1	1	24	23	21	26	19	25	31	<i>37e-4/6e3</i>	NEWUOA [23]
(1+1)-ES	1	1	1.4	7.3	6.1	7.9	3	2.6	3.8	6.1	(1+1)-ES [1]
PSO	1	1	1.4	220	140	62	29	28	15	11	PSO [6]
PSO_Bounds	1	1	1.6	1.2	66	140	53	32	18	10	PSO_Bounds [7]
Monte Carlo	1	1	1.1	1	1	1.3	1.6	2.6	3.5	21	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	2.7	20	37	35	11	11	5.8	3.3	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.3	3.6	2.7	1.9	1.3	1	1	1.6	SNOBFIT [17]
VNS (Garcia)	1	1	1	17	48	23	11	6.7	4.7	3	VNS (Garcia) [10]

Table 30: 02-D, running time excess ERT/ERT_{best} on f_{130} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	130 Gallagher Cauchy										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.5	0.5	0.767	22.6	99.2	248	399	824	886	2220	ERT_{best}/D
ALPS	1	1	1.7	1	1	1.5	1.5	1.3	4.1	15	ALPS [15]
AMaLGaM IDEA	1	1	1.2	45	39	16	17	17	20	8.1	AMaLGaM IDEA [4]
avg NEWUOA	1	1	3.2	8.2	3.7	2.6	3.6	3.9	7.5	6.9	avg NEWUOA [23]
BayEDAcG	1	1	1.3	2.9	9	11	9.7	7.9	10	13	BayEDAcG [9]
BFGS	1	1	13	22	15	14	12	12	20	25	BFGS [22]
BIPOP-CMA-ES	1	1	1.4	24	21	10	6.5	3.2	3	1.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.6	11	4.3	1.8	3.1	3.1	4	4.7	(1+1)-CMA-ES [2]
DASA	1	1	60	85	88	67	63	120	320	700	DASA [18]
DEPSO	1	1	2	2.3	2.6	1.8	1.8	1.2	2.5	2.3	DEPSO [11]
EDA-PSO	1	1	1.6	2	2.5	6.2	7.3	15	21	140	EDA-PSO [5]
full NEWUOA	1	1	2.3	10	5	3.1	3.9	2.1	3.8	6.2	full NEWUOA [23]
GLOBAL	1	1	1.3	2.3	1.4	1.5	1.4	1	1	1.1	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.5	86	72	38	27	22	21	13	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.5	2.4	1.6	2.1	2.2	1.7	2.1	1	MA-LS-Chain [19]
MCS (Neum)	1	1	1.7	2.2	1.1	1	1	4.3	17	50	MCS (Neum) [16]
NEWUOA	1	1	2.8	9.8	5.4	3.7	3.8	3.6	4.7	6.6	NEWUOA [23]
(1+1)-ES	1	1	2.2	6.8	4.1	2.4	2.5	3.1	3.9	6	(1+1)-ES [1]
PSO	1	1	1.7	330	110	110	150	110	110	70	PSO [6]
PSO_Bounds	1	1	1.7	2	160	200	170	110	130	83	PSO_Bounds [7]
Monte Carlo	1	1	1.3	1.6	1.5	2.1	4.1	4	15	38	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	7.8	14	7.9	5.9	2.9	2.8	1.1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1	2.4	1.4	1.1	2	2.1	8.1	7.4	SNOBFIT [17]
VNS (Garcia)	1	1	1.2	160	60	34	24	14	17	11	VNS (Garcia) [10]

Table 31: 03-D, running time excess ERT/ERT_{best} on f_{101} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	101 Sphere moderate Gauss										
$\Delta\text{ftarget}$ ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$ ERT_{best}/D
ALPS	1	1.1	3.2	21	59	110	130	160	190	240	ALPS [15]
AMaLGaM IDEA	1	1	2.8	5.3	7.3	9.6	9.9	11	12	15	AMaLGaM IDEA [4]
avg NEWUOA	1	2.1	3.4	1.6	1.7	1.9	1.5	1.4	1.4	1.4	avg NEWUOA [23]
BayEDAcG	1	1	2.8	52	130	230	220	200	200	230	BayEDAcG [9]
BFGS	1	1	160	800	4100	<i>46e-2/4e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	4.9	4	5.3	8.1	7.8	8.6	9.8	12	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	3.1	3.1	3.6	4.8	4.4	5	5.5	6.5	(1+1)-CMA-ES [2]
DASA	1	1.2	54	25	31	33	32	35	40	42	DASA [18]
DEPSO	1	1.1	3.9	11	17	24	25	28	34	40	DEPSO [11]
EDA-PSO	1	1.1	1.3	7.3	12	24	41	69	97	150	EDA-PSO [5]
full NEWUOA	1	1	4.1	1.7	1.4	1.4	1.1	1	1	1	full NEWUOA [23]
GLOBAL	1	1.1	2.9	17	16	16	12	11	11	10	GLOBAL [20]
iAMaLGaM IDEA	1	1	3	2.9	4.4	6.4	6.3	6.8	8.1	9.8	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.1	2.5	8.2	15	23	20	19	20	20	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1.4	2.3	2	240	1600	<i>96e-7/2e4</i>	MCS (Neum) [16]
NEWUOA	1	1.5	2.8	2	2.5	2.9	2.4	2.2	2.3	2.2	NEWUOA [23]
(1+1)-ES	1	1.5	3	3	3.5	4.7	4.4	4.5	5.2	6.2	(1+1)-ES [1]
PSO	1	1	1.7	7.7	18	39	44	56	71	97	PSO [6]
PSO_Bounds	1	1	1.9	7.7	30	110	130	180	230	300	PSO_Bounds [7]
Monte Carlo	1	1.2	1.9	16	360	1.1e4	2.7e5	1.3e6	<i>17e-4/1e6</i>	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.1	3.1	2.8	4.4	6.5	5.9	6.9	7.7	9.3	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	1.8	1.1	1	1	1	1.2	1.5	1.7	SNOBFIT [17]
VNS (Garcia)	1	1	2.6	8.5	10	12	11	11	12	13	VNS (Garcia) [10]

Table 32: 03-D, running time excess ERT/ERT_{best} on f_{102} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	102 Sphere moderate unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.333	0.333	1.2	4.04	7.56	9.33	10.8	11.6	13	16	ERT_{best}/D	
ALPS	1	1	3.2	13	54	83	120	150	170	190	ALPS [15]	
AMaLGaM IDEA	1	1.1	2.5	5.1	5.7	6.5	7.7	9.3	9.9	11	AMaLGaM IDEA [4]	
avg NEWUOA	1	1.9	3.6	2.8	2.9	2.6	2.8	2.7	2.5	2.2	avg NEWUOA [23]	
BayEDAcG	1	1.1	2.6	17	110	100	190	180	210	180	BayEDAcG [9]	
BFGS	1	6.1	140	1500	7200	<i>11e-1/4e3</i>	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	1	1	3.9	3.2	4.6	5.5	6.5	8	8.3	9.1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	1.5	2.5	2.6	3	3.4	4	4.6	4.8	5.2	(1+1)-CMA-ES [2]	
DASA	1	6.5	36	29	32	39	38	44	48	52	DASA [18]	
DEPSO	1	1	1	11	15	17	21	27	29	33	DEPSO [11]	
EDA-PSO	1	1.1	2.5	8.2	11	15	30	63	82	120	EDA-PSO [5]	
full NEWUOA	1	1	3.1	1.7	1.1	1	1	1	1	1	full NEWUOA [23]	
GLOBAL	1	1	2.9	14	14	12	10	10	9.3	8.1	GLOBAL [20]	
iAMaLGaM IDEA	1	1	2.2	3	3.2	4.2	5.5	6.6	7.1	7.8	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1.1	2.8	10	12	16	19	19	19	17	MA-LS-Chain [19]	
MCS (Neum)	1	1	1	1	1.4	38	140	1100	5800	<i>26e-6/2e4</i>	MCS (Neum) [16]	
NEWUOA	1	1.5	5.9	5.7	5.4	7.2	6.8	8.1	9.1	10	NEWUOA [23]	
(1+1)-ES	1	1.1	3.8	3.1	2.7	3.2	3.6	4.2	4.3	4.7	(1+1)-ES [1]	
PSO	1	1	2.5	6.8	15	26	37	53	64	80	PSO [6]	
PSO_Bounds	1	1	2.5	7.7	19	73	110	160	180	230	PSO_Bounds [7]	
Monte Carlo	1	1.1	1.5	11	320	5700	3e5	<i>20e-4/1e6</i>	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	1	3.8	3.5	3.9	4.9	5.1	6.2	6.6	7.2	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1.1	1	1.5	1	1.2	1.4	1.6	2	2.2	SNOBFIT [17]	
VNS (Garcia)	1	1	2.6	9.9	9.9	9.4	9.5	10	10	11	VNS (Garcia) [10]	

Table 33: 03-D, running time excess ERT/ERT_{best} on f_{103} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	103 Sphere moderate Cauchy										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	1.2	4.33	6.38	6.38	6.38	6.58	7.73	14.2	ERT_{best}/D
ALPS	1	1	2.6	19	71	120	200	280	2e3	2.5e5	ALPS [15]
AMaLGaM IDEA	1	1.1	4.9	6.4	7.6	13	57	91	340	620	AMaLGaM IDEA [4]
avg NEWUOA	1	1.9	3.3	1.7	1.6	2	5.6	9.2	10	9	avg NEWUOA [23]
BayEDAcG	1	1	2.2	17	140	310	320	510	440	330	BayEDAcG [9]
BFGS	1	1.3	3.5	3.7	2.5	2.6	2.6	2.5	2.1	1.2	BFGS [22]
BIPOP-CMA-ES	1	1.3	5.1	4	5.3	7.8	12	14	15	12	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	3.4	3.2	4.9	7.8	25	40	66	170	(1+1)-CMA-ES [2]
DASA	1	5.1	59	33	49	130	440	2800	1.6e4	1e6	DASA [18]
DEPSO	1	1	1.9	12	17	28	64	110	120	190	DEPSO [11]
EDA-PSO	1	1.1	1.9	6.7	11	21	100	730	8e3	<i>69e-7/1e5</i>	EDA-PSO [5]
full NEWUOA	1	1	3.5	1.6	1.3	1.3	2	3.2	2.8	1.8	full NEWUOA [23]
GLOBAL	1	1.1	1.9	12	14	17	20	32	35	33	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	2.6	3.5	4.4	6.9	9.3	12	220	810	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.1	3.5	7.8	13	23	34	36	35	25	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1.3	2	2.1	36	87	86	MCS (Neum) [16]
NEWUOA	1	1	3.4	2.1	2.6	3.4	4.8	5.9	5.8	9.8	NEWUOA [23]
(1+1)-ES	1	1.1	3.3	2.8	3.7	7.2	14	70	160	880	(1+1)-ES [1]
PSO	1	1	2.5	7.5	18	58	340	1600	2.3e4	<i>19e-6/1e5</i>	PSO [6]
PSO_Bounds	1	1.1	2.3	6.1	31	95	250	4800	2.8e4	<i>14e-6/1e5</i>	PSO_Bounds [7]
Monte Carlo	1	1	3.4	18	320	1.2e4	5.3e5	<i>14e-4/1e6</i>	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	4.5	4.2	5.1	7.6	10	12	13	9.3	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	2.3	1.1	1	1	1	1	1	1	SNOBFIT [17]
VNS (Garcia)	1	1	2.6	9.4	12	14	16	19	20	13	VNS (Garcia) [10]

Table 34: 03-D, running time excess ERT/ERT_{best} on f_{104} , in *italics* is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	104 Rosenbrock moderate Gauss										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	1.4	5.96	8.8	65.4	201	212	216	218	219	223	ERT_{best}/D
ALPS	1.6	4.8	23	11	9.1	21	29	37	46	62	ALPS [15]
AMaLGaM IDEA	2.6	2.8	3.7	1.9	1.3	1.6	1.8	2	2.2	2.4	AMaLGaM IDEA [4]
avg NEWUOA	2.5	1	1	3.2	2.6	3.3	3.4	4.1	4.1	4.1	avg NEWUOA [23]
BayEDAcG	2.5	3.1	8.4	19	140	<i>76e-2/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	160	190	3600	<i>28e+0/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	3.5	2.1	3.6	3.6	2.2	2.7	3	3.2	3.4	3.6	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.9	1.5	2.2	2.8	1.9	2.2	2.4	2.4	2.4	2.5	(1+1)-CMA-ES [2]
DASA	44	18	30	23	48	140	320	660	2900	<i>36e-7/1e6</i>	DASA [18]
DEPSO	4.8	6.3	9.9	4.3	4.9	9.2	44	140	<i>28e-4/2e3</i>	.	DEPSO [11]
EDA-PSO	3	3.1	8	14	17	33	44	60	78	110	EDA-PSO [5]
full NEWUOA	4.1	2.1	1.9	1.1	1	1	1	1	1	1	full NEWUOA [23]
GLOBAL	2	6.8	11	1.8	1	1	1	1	1	1.1	GLOBAL [20]
iAMaLGaM IDEA	1.8	1.6	2.6	14	5	5	5.1	5.2	5.3	5.4	iAMaLGaM IDEA [4]
MA-LS-Chain	3.9	3.7	6.5	2.8	3.1	3.4	3.8	4.1	4.4	4.5	MA-LS-Chain [19]
MCS (Neum)	1	1.2	1.1	7.9	39	560	<i>30e-3/2e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	2.8	1.1	1.1	1	2.7	8.2	18	28	34	40	NEWUOA [23]
(1+1)-ES	3.6	1.8	2.1	2.7	6.6	20	37	180	510	2900	(1+1)-ES [1]
PSO	2.3	2.6	7.1	5.8	6.5	15	26	42	60	100	PSO [6]
PSO_Bounds	3.2	2.6	11	12	45	270	390	780	800	860	PSO_Bounds [7]
Monte Carlo	3.7	7.4	53	180	2700	<i>43e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	4	2.3	2.9	1.8	5.4	5.3	5.4	5.4	5.5	5.5	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.5	1.4	2.1	7.8	13	55	110	<i>12e-2/2e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	2.5	7.2	7.5	2.5	1.3	1.5	1.7	1.7	1.8	1.9	VNS (Garcia) [10]

Table 35: 03-D, running time excess ERT/ERT_{best} on f_{105} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

105 Rosenbrock moderate unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	1.4	5.64	9.29	113	357	1080	1080	1090	1090	1100	ERT_{best}/D
ALPS	4.2	7.7	28	7.3	4.7	2.9	4.5	6.4	8	11	ALPS [15]
AMaLGaM IDEA	3.7	2.5	3.2	5.2	2.8	1.4	1.4	1.5	1.5	1.6	AMaLGaM IDEA [4]
avg NEWUOA	2.7	1.8	1.8	1.1	1.6	3.2	8.2	35	75	<i>20e-4/6e3</i>	avg NEWUOA [23]
BayEDAcG	3.5	3.3	26	22	<i>10e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	160	130	910	<i>20e+0/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.2	2.7	4.1	1.5	2.5	1	1.2	1.2	1.3	1.3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.7	1.6	2.1	2.1	3.4	1.9	4.9	7.8	9.6	10	(1+1)-CMA-ES [2]
DASA	69	24	22	23	34	32	94	300	710	4400	DASA [18]
DEPSO	4.3	5	7.7	1.8	2.5	2.1	8.6	27	<i>71e-4/2e3</i>	.	DEPSO [11]
EDA-PSO	3.2	3.9	6.9	8.8	9.1	6.1	9	12	16	23	EDA-PSO [5]
full NEWUOA	4.6	1.7	1.4	1.8	3	4.7	6.7	14	21	45	full NEWUOA [23]
GLOBAL	2.5	3.7	11	1.6	1	1	1	1	1	1	GLOBAL [20]
iAMaLGaM IDEA	2.5	1.5	2.1	7.4	3.7	1.3	1.3	1.3	1.3	1.4	iAMaLGaM IDEA [4]
MA-LS-Chain	3.1	5.3	7.1	2.3	11	4.8	5.2	5.4	5.4	5.4	MA-LS-Chain [19]
MCS (Neum)	1	1	1	6.7	37	100	<i>57e-3/2e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	5	2.2	1.5	1	1.9	2	7.5	21	69	70	NEWUOA [23]
(1+1)-ES	6.1	3.2	2.8	2.4	3.9	5	12	38	100	1500	(1+1)-ES [1]
PSO	4.4	2.7	10	74	29	13	20	25	31	42	PSO [6]
PSO_Bounds	1.7	5.5	14	69	27	51	54	74	79	84	PSO_Bounds [7]
Monte Carlo	2.2	7.8	50	130	1400	6300	<i>45e-3/1e6</i>	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	5.1	2.7	2.8	5.4	5.2	1.8	2	2	2	2	IPOP-SEP-CMA-ES [21]
SNOBFIT	3.8	2	1.8	2.5	10	11	10	<i>16e-2/2e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	2.5	8	7.9	18	8.5	3.4	3.7	4.5	5.7	8.1	VNS (Garcia) [10]

Table 36: 03-D, running time excess ERT/ERT_{best} on f_{106} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

106 Rosenbrock moderate Cauchy												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	1.4	6.87	9.6	22.8	52	148	253	276	431	482	ERT_{best}/D	
ALPS	2.4	5.3	21	29	37	25	55	240	1900	<i>37e-7/2e6</i>	ALPS [15]	
AMaLGaM IDEA	2.9	2	3.7	18	30	34	31	32	27	43	AMaLGaM IDEA [4]	
avg NEWUOA	3.1	1.1	1.1	2.4	1.9	1	2.1	3.3	5	7.5	avg NEWUOA [23]	
BayEDAcG	3.8	3.8	7.5	32	<i>73e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]	
BFGS	18	7	12	18	23	13	8	7.6	7.6	7.6	BFGS [22]	
BIPOP-CMA-ES	4.6	1.9	3	7.1	6.9	3.3	2.1	2.2	1.5	1.5	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1.7	1.1	1.9	5.5	6.1	6.2	7.2	11	19	97	(1+1)-CMA-ES [2]	
DASA	21	12	14	150	190	270	540	6600	<i>10e-5/1e6</i>	.	DASA [18]	
DEPSO	4.6	3.2	11	12	34	200	<i>38e-3/2e3</i>	.	.	.	DEPSO [11]	
EDA-PSO	4.9	3.1	7.6	44	69	52	460	1600	3300	<i>97e-5/1e5</i>	EDA-PSO [5]	
full NEWUOA	4.2	1.3	1.2	1	1	1	1	1	1.4	1.6	full NEWUOA [23]	
GLOBAL	2.2	4	9.4	6.8	3.8	2.1	1.3	2.5	3.7	16	GLOBAL [20]	
iAMaLGaM IDEA	3.5	1.5	2.4	37	41	24	22	31	25	51	iAMaLGaM IDEA [4]	
MA-LS-Chain	3.4	4.4	6.4	8.3	7	3.4	2.4	2.3	1.6	1.6	MA-LS-Chain [19]	
MCS (Neum)	1	1	1	23	230	810	980	<i>40e-3/2e4</i>	.	.	MCS (Neum) [16]	
NEWUOA	3	1	1	3.3	5.6	4.4	7.4	14	13	33	NEWUOA [23]	
(1+1)-ES	3.4	2.3	2.1	3.5	24	32	100	240	1200	3e4	(1+1)-ES [1]	
PSO	2.4	3.6	8	14	230	910	1700	5400	<i>14e-3/1e5</i>	.	PSO [6]	
PSO_Bounds	2.2	3.9	11	33	170	620	480	1500	<i>17e-4/1e5</i>	.	PSO_Bounds [7]	
Monte Carlo	4.9	7.9	43	590	9100	<i>42e-3/1e6</i>	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	3.7	1.8	2.9	7.5	7.1	3	1.9	1.8	1.2	1.2	IPOP-SEP-CMA-ES [21]	
SNOBFIT	2.9	1.6	1.9	3.6	63	160	<i>12e-2/2e3</i>	.	.	.	SNOBFIT [17]	
VNS (Garcia)	2.5	6.7	7.1	8.1	5.6	2.3	1.5	1.5	1	1	VNS (Garcia) [10]	

Table 37: 03-D, running time excess ERT/ERT_{best} on f_{107} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	107 Sphere Gauss										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	1.96	15.6	51	77.4	108	138	168	228	ERT_{best}/D
ALPS	1	1.1	2.1	4.3	9	13	14	16	16	18	ALPS [15]
AMaLGaM IDEA	1	1	1.7	1.6	7.8	5.8	4.6	9.5	8	6.3	AMaLGaM IDEA [4]
avg NEWUOA	1	1	17	20	45	120	360	590	<i>16e-3/6e3</i>	.	avg NEWUOA [23]
BayEDAcG	1	1	2.3	4.2	4	6.2	6.8	6.9	7.1	7.4	BayEDAcG [9]
BFGS	1	1	87	310	<i>10e-1/3e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	4	1.8	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	17	9.8	13	16	19	32	61	140	(1+1)-CMA-ES [2]
DASA	1	1.5	280	560	1400	5e3	2.6e4	9.2e4	<i>24e-4/8e5</i>	.	DASA [18]
DEPSO	1	1.2	2.4	3.2	2.5	3.5	3.3	3.6	3.6	3.6	DEPSO [11]
EDA-PSO	1	1.1	1.6	2.2	6.1	23	32	36	38	42	EDA-PSO [5]
full NEWUOA	1	1	25	21	40	85	130	350	610	<i>28e-4/7e3</i>	full NEWUOA [23]
GLOBAL	1	1	1.6	4.8	6.5	11	22	38	31	<i>66e-4/700</i>	GLOBAL [20]
iAMaLGaM IDEA	1	1	3.4	16	14	23	16	15	12	11	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.2	1.6	3	4	5.8	5.8	5.6	5	4.6	MA-LS-Chain [19]
MCS (Neum)	1	1	2.4	1	13	81	670	<i>16e-4/2e4</i>	.	.	MCS (Neum) [16]
NEWUOA	1	1.1	12	29	61	65	150	530	<i>57e-4/5e3</i>	.	NEWUOA [23]
(1+1)-ES	1	1.1	13	17	14	18	27	64	180	780	(1+1)-ES [1]
PSO	1	1.1	1.2	1.5	2	4.3	5.4	5.9	6.2	7.2	PSO [6]
PSO_Bounds	1	1.1	1	2.9	5.4	10	14	18	20	22	PSO_Bounds [7]
Monte Carlo	1	1.1	2	4.3	58	980	2.2e4	<i>16e-4/1e6</i>	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	58	8	5	3.9	3.2	4.2	4.2	3.8	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	2.5	3.6	5.9	7.8	8.8	12	15	35	SNOBFIT [17]
VNS (Garcia)	1	1	1.6	2.3	1.8	1.6	4.2	3.5	3.1	2.8	VNS (Garcia) [10]

Table 38: 03-D, running time excess ERT/ERT_{best} on f_{108} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

108 Sphere unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	1.93	32.8	655	1840	3610	5060	5730	10700	ERT_{best}/D
ALPS	1	1.1	1.4	1.7	1.8	1.5	1.7	2.1	2.7	3.1	ALPS [15]
AMaLGaM IDEA	1	1	1.3	45	11	9.2	13	15	19	32	AMaLGaM IDEA [4]
avg NEWUOA	1	1.5	120	82	130	<i>39e-2/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.1	2.4	25	<i>64e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	38	32	<i>92e-2/800</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.2	36	7.5	1.2	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	72	21	7.2	25	<i>42e-3/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	1	11	510	350	230	660	3400	<i>99e-4/8e5</i>	.	.	DASA [18]
DEPSO	1	1	4.4	6	6	<i>11e-2/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.1	1.5	1.9	1	2.2	2.6	5.1	7.2	6.6	EDA-PSO [5]
full NEWUOA	1	15	82	180	50	<i>31e-2/7e3</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	2.1	4.8	2.6	10	<i>92e-3/1e3</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	92	57	20	17	16	32	44	100	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.9	2.8	1	1.4	1.5	2	5	20	MA-LS-Chain [19]
MCS (Neum)	1	1	3.2	3.9	8.8	130	<i>37e-3/2e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	110	56	36	<i>41e-2/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	24	39	13	43	280	<i>53e-5/1e6</i>	.	.	(1+1)-ES [1]
PSO	1	1	1	1	13	12	11	11	23	42	PSO [6]
PSO_Bounds	1	1.1	2.2	2.6	1	22	35	45	41	64	PSO_Bounds [7]
Monte Carlo	1	1	1.1	3.1	2.7	36	370	<i>92e-5/1e6</i>	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	180	44	7	6	3.7	30	<i>91e-5/1e4</i>	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.5	4.2	4	13	<i>11e-2/2e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1.6	69	10	8.4	13	22	150	490	VNS (Garcia) [10]

Table 39: 03-D, running time excess ERT/ERT_{best} on f_{109} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	109 Sphere Cauchy										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	1.2	6.84	31.1	48.5	64.3	64.5	83.7	83.7	ERT_{best}/D
ALPS	1	1.1	2.1	13	15	36	630	1.3e4	1.4e5	<i>42e-6/2e6</i>	ALPS [15]
AMaLGaM IDEA	1	1.1	3.3	38	9.3	25	52	92	120	210	AMaLGaM IDEA [4]
avg NEWUOA	1	1.5	3.4	7.6	5.9	8.9	17	58	110	260	avg NEWUOA [23]
BayEDAcG	1	1	2.4	27	36	25	21	25	21	36	BayEDAcG [9]
BFGS	1	9.3	39	8.7	2.1	1.3	1	1	1	1	BFGS [22]
BIPOP-CMA-ES	1	1	2.9	2.3	1.2	1.5	1.6	2.4	2.4	3.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.2	2.9	5.5	2.6	47	410	<i>18e-4/1e4</i>	.	.	(1+1)-CMA-ES [2]
DASA	1	3.1	200	400	1700	1.1e4	2e5	<i>63e-4/9e5</i>	.	.	DASA [18]
DEPSO	1	1	3.1	6.4	4.2	7	14	76	350	<i>15e-5/2e3</i>	DEPSO [11]
EDA-PSO	1	1	2	3.8	3	110	1400	<i>83e-5/1e5</i>	.	.	EDA-PSO [5]
full NEWUOA	1	1	6.4	2.1	1.4	1.6	1.7	2.2	1.7	1.7	full NEWUOA [23]
GLOBAL	1	1.2	4.5	10	3.7	4.6	25	<i>39e-4/500</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	2.5	2	8.1	18	47	79	140	490	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.1	3.3	5.4	3.1	5.8	10	20	26	56	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	18	81	110	150	160	190	MCS (Neum) [16]
NEWUOA	1	1.3	5.3	6.2	6.4	12	34	150	180	<i>17e-5/5e3</i>	NEWUOA [23]
(1+1)-ES	1	1	3.8	1.9	3.3	27	380	2200	8.2e4	<i>25e-6/1e6</i>	(1+1)-ES [1]
PSO	1	1	2.2	8.4	12	290	2900	7300	1.8e4	<i>19e-4/1e5</i>	PSO [6]
PSO_Bounds	1	1.1	2.2	3.7	12	3100	2.2e4	2.3e4	<i>18e-3/1e5</i>	.	PSO_Bounds [7]
Monte Carlo	1	1.1	1.6	9.5	100	2500	4.8e4	<i>19e-4/1e6</i>	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	3.4	1.8	1	1	1.7	2.4	2.5	3.6	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	2.6	1.1	2.5	17	60	380	<i>31e-4/2e3</i>	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.6	5.9	2.4	2.1	2.4	3.1	3	4.2	VNS (Garcia) [10]

Table 40: 03-D, running time excess ERT/ERT_{best} on f_{110} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

110 Rosenbrock Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	1.44	8.44	18.7	307	2090	6820	11800	20400	20700	21200	ERT_{best}/D
ALPS	2.3	3.9	9.5	2.6	1	1.2	1	1.2	1.6	2.5	ALPS [15]
AMaLGaM IDEA	2.7	1.8	2.2	8.4	33	26	16	9.1	9.1	8.9	AMaLGaM IDEA [4]
avg NEWUOA	18	18	15	6.6	8.4	<i>34e-2/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	2.3	3	7.8	4.8	14	4.2	<i>60e-2/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	50	59	220	<i>19e+0/1e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	3.2	1.5	2	3	5.6	2.9	1.7	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	8.1	5.8	6.7	2.5	2.2	3.7	13	<i>17e-3/1e4</i>	.	.	(1+1)-CMA-ES [2]
DASA	410	230	270	110	170	180	240	630	<i>43e-4/9e5</i>	.	DASA [18]
DEPSO	6.9	4.4	5.1	1	1.9	1	2.5	<i>16e-2/2e3</i>	.	.	DEPSO [11]
EDA-PSO	2.4	2.1	3.9	4.3	43	<i>98e-3/1e5</i>	.	.	.	.	EDA-PSO [5]
full NEWUOA	53	20	15	9.8	8.5	7.4	8.8	<i>20e-2/7e3</i>	.	.	full NEWUOA [23]
GLOBAL	4.2	3.5	6.5	1.6	1.7	<i>91e-2/400</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.2	1.2	1.6	8.4	8.5	11	9.8	5.8	5.8	5.7	iAMaLGaM IDEA [4]
MA-LS-Chain	3.2	3.8	4	1.1	6.5	16	9.2	11	<i>76e-3/2e4</i>	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	5.9	8.6	<i>87e-3/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	23	20	24	9	4.3	11	<i>22e-2/5e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	6.2	6.3	6.8	2.7	1.6	2	4.1	7.1	63	690	(1+1)-ES [1]
PSO	2.4	2.6	5.3	25	97	59	55	32	72	<i>21e-2/1e5</i>	PSO [6]
PSO_Bounds	2.4	2.1	5.6	26	73	30	35	<i>25e-2/1e5</i>	.	.	PSO_Bounds [7]
Monte Carlo	2	3.2	16	55	200	2100	<i>32e-3/1e6</i>	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	3.8	15	7.6	3.9	9.9	6.1	3.5	3.3	3.2	6.8	IPOP-SEP-CMA-ES [21]
SNOBFIT	3.4	1.6	2.9	4.2	3.4	3.6	<i>76e-2/2e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	2.4	71	34	20	16	8.4	7.6	5.2	6.8	11	VNS (Garcia) [10]

Table 41: 03-D, running time excess ERT/ERT_{best} on f_{111} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

111 Rosenbrock unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	3.36	17.2	58	1160	9990	25300	64900	2e5	4.76e5	4.91e5	ERT_{best}/D
ALPS	1.8	2.1	4.8	1.3	1	1	1	1	1.2	6.1	ALPS [15]
AMaLGaM IDEA	1.1	1.4	1	4.2	7	16	22	9.1	9.1	30	AMaLGaM IDEA [4]
avg NEWUOA	52	66	55	<i>45e-1/6e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.7	4.6	45	11	<i>15e+0/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	15	12	150	<i>25e+0/600</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	3	9.5	4.1	1.4	3.1	13	6.2	2.4	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	20	16	17	9.3	15	<i>89e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	310	310	350	250	210	<i>29e-2/8e5</i>	.	.	.	.	DASA [18]
DEPSO	2.1	2.1	4.2	3.4	<i>12e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.1	5	2.9	19	57	<i>15e-2/1e5</i>	.	.	.	EDA-PSO [5]
full NEWUOA	79	73	96	25	<i>76e-1/7e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1.2	1.9	4.3	3	2	<i>25e-1/1e3</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.1	18	32	11	13	13	12	16	15	30	iAMaLGaM IDEA [4]
MA-LS-Chain	1.5	2	2.4	1	1.7	8.9	<i>52e-3/2e4</i>	.	.	.	MA-LS-Chain [19]
MCS (Neum)	2.2	2.4	7.4	7.5	5.3	<i>47e-2/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	32	42	85	32	7.8	<i>74e-1/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	17	12	11	5.3	8.7	36	<i>64e-4/1e6</i>	.	.	.	(1+1)-ES [1]
PSO	1.1	1	1.8	11	8.4	16	10	3.4	<i>87e-3/1e5</i>	.	PSO [6]
PSO_Bounds	1.3	1.4	2.9	1.6	4.5	8.9	10	<i>25e-3/1e5</i>	.	.	PSO_Bounds [7]
Monte Carlo	1	2.4	8.9	19	80	<i>75e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	2.9	26	24	5.1	4.5	5.9	<i>47e-2/1e4</i>	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.8	1.9	8.6	6.4	<i>37e-1/2e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	27	46	6	6.4	8.1	9.3	16	28	<i>13e-6/9e6</i>	VNS (Garcia) [10]

Table 42: 03-D, running time excess ERT/ERT_{best} on f_{112} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

112 Rosenbrock Cauchy											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	1.4	6.38	9.6	113	523	826	950	993	1040	1180	ERT_{best}/D
ALPS	4.3	9.1	27	7.4	5.3	37	1400	1.2e4	<i>55e-5/2e6</i>	.	ALPS [15]
AMaLGaM IDEA	2.5	2.5	4	12	24	63	80	89	140	170	AMaLGaM IDEA [4]
avg NEWUOA	2.8	1.1	2.1	2.2	1.8	9.5	85	<i>20e-3/6e3</i>	.	.	avg NEWUOA [23]
BayEDAcG	3.3	3.5	7.7	22	<i>10e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	39	53	70	43	<i>11e-1/3e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	3.8	2	3	1	1	1	1	1.1	1.1	1.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.9	2.1	3.3	2.6	6.4	29	<i>18e-3/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	39	59	90	61	87	1200	7e3	1.4e4	<i>48e-4/1e6</i>	.	DASA [18]
DEPSO	5.3	3.5	7.8	3.5	16	<i>42e-2/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	3.5	3.1	6.1	6.4	61	1800	<i>39e-3/1e5</i>	.	.	.	EDA-PSO [5]
full NEWUOA	4.3	1.4	2.2	1.7	5.6	13	49	<i>13e-3/7e3</i>	.	.	full NEWUOA [23]
GLOBAL	2.5	5.1	11	2	2.4	<i>30e-2/400</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	3	1.8	2.4	4.9	51	58	74	100	140	200	iAMaLGaM IDEA [4]
MA-LS-Chain	3.3	4.6	6.9	1.8	2.7	6.2	18	44	95	<i>60e-5/2e4</i>	MA-LS-Chain [19]
MCS (Neum)	1	1.1	1	11	50	<i>12e-2/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	2	1	1.3	1.7	1.4	8.7	37	73	<i>44e-4/5e3</i>	.	NEWUOA [23]
(1+1)-ES	4.3	2.4	2.5	2.1	3.2	23	320	3300	<i>30e-5/1e6</i>	.	(1+1)-ES [1]
PSO	2.6	3.4	7.7	77	400	340	<i>20e-2/1e5</i>	.	.	.	PSO [6]
PSO_Bounds	3.7	2.9	12	7.8	170	200	1500	<i>72e-3/1e5</i>	.	.	PSO_Bounds [7]
Monte Carlo	3.4	10	41	160	960	8300	<i>60e-3/1e6</i>	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	2.3	1.7	2.7	2.5	1.2	1.1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.5	1.3	2.2	5.9	6.1	30	<i>17e-2/2e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	2.5	7.4	7.9	3.2	1.3	1.1	1	1.1	1.1	1	VNS (Garcia) [10]

Table 43: 03-D, running time excess ERT/ERT_{best} on f_{113} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

113 Step-ellipsoid Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	1.13	8.8	42.2	649	1030	1080	1080	1080	1140	ERT_{best}/D
ALPS	1.3	1.7	3.1	7.2	1.5	1.8	2.1	2.1	2.1	2.2	ALPS [15]
AMaLGaM IDEA	1.5	2	1.1	1	1.9	2.1	2	2	2	1.9	AMaLGaM IDEA [4]
avg NEWUOA	1.6	5.6	8.2	15	8	25	75	75	75	<i>57e-3/6e3</i>	avg NEWUOA [23]
BayEDAcG	1.4	1	1.8	2.8	3.4	8.5	8.2	8.2	8.2	8	BayEDAcG [9]
BFGS	7.1	43	95	710	<i>19e-1/2e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.2	15	3.7	2.4	2.4	1.9	1.9	1.9	1.9	1.8	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.3	1.8	16	12	2.5	6.8	22	22	22	22	(1+1)-CMA-ES [2]
DASA	5.7	170	220	530	120	800	1e3	1e3	1e3	1400	DASA [18]
DEPSO	1.2	2.9	3.3	2.9	1	1	1	1	1	1	DEPSO [11]
EDA-PSO	1.3	2.1	2.2	3.7	2.4	3.6	3.7	3.7	3.7	4.4	EDA-PSO [5]
full NEWUOA	1.5	7.5	9.7	14	7.7	16	95	95	95	<i>15e-3/7e3</i>	full NEWUOA [23]
GLOBAL	1.5	2.6	1.8	3.9	2.3	4.2	<i>12e-2/400</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.2	1.5	25	17	4.8	4.6	4.6	4.6	4.6	4.4	iAMaLGaM IDEA [4]
MA-LS-Chain	1.3	1.9	1.8	3.6	2.4	2	2.1	2.1	2.1	2.1	MA-LS-Chain [19]
MCS (Neum)	1	2.1	2.3	2.7	3.8	50	230	230	230	<i>15e-3/2e4</i>	MCS (Neum) [16]
NEWUOA	1.5	14	7.7	14	5.1	12	70	70	70	<i>74e-3/5e3</i>	NEWUOA [23]
(1+1)-ES	1.9	16	11	7.3	2.1	14	23	23	23	28	(1+1)-ES [1]
PSO	1.3	1.7	1.4	3.7	1.2	10	12	12	12	11	PSO [6]
PSO_Bounds	1.3	1.3	1.6	2.9	1.6	2.3	2.6	2.6	2.6	2.8	PSO_Bounds [7]
Monte Carlo	1.3	1.4	3	17	28	520	1300	1300	1300	4200	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.9	4.2	26	16	3.5	3	2.9	2.9	2.9	3.1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.2	1.1	1	8	4.7	6.9	6.6	6.6	6.6	6.2	SNOBFIT [17]
VNS (Garcia)	1	2.5	3.1	11	5.8	6.2	6.8	6.8	6.8	6.4	VNS (Garcia) [10]

Table 44: 03-D, running time excess ERT/ERT_{best} on f_{114} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

114 Step-ellipsoid unif											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	0.333	0.978	8.53	338	2090	6290	9440	9440	9440	10900	ERT_{best}/D
ALPS	1.2	2	2.4	1.4	1.1	1.4	1.1	1.1	1.1	1.4	ALPS [15]
AMaLGaM IDEA	1.3	1.8	2.9	8.5	7.1	4.8	3.4	3.4	3.4	3.1	AMaLGaM IDEA [4]
avg NEWUOA	1	140	100	26	<i>11e-1/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.2	2	19	12	<i>18e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	3.4	34	20	34	<i>26e-1/800</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.8	16	1.7	1.2	1.4	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.1	18	27	5.3	12	<i>17e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	16	160	540	110	520	940	1300	1300	1300	1100	DASA [18]
DEPSO	1.3	1	3.5	2.5	4.5	4.8	3.2	3.2	3.2	<i>22e-2/2e3</i>	DEPSO [11]
EDA-PSO	1.3	1.7	2.8	1.1	2.6	2.9	4.1	4.1	4.1	6.3	EDA-PSO [5]
full NEWUOA	1.5	65	96	41	50	<i>13e-1/7e3</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1.5	1.6	2.5	1.1	2.8	<i>34e-2/1e3</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.4	1.6	120	17	13	8.8	6	6	6	5.5	iAMaLGaM IDEA [4]
MA-LS-Chain	1.1	1.8	1	1	1	1	1	1	1	1.3	MA-LS-Chain [19]
MCS (Neum)	1	1.9	4.9	3.6	8.1	<i>93e-3/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	50	71	31	<i>11e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	20	55	25	8.1	14	46	51	51	51	230	(1+1)-ES [1]
PSO	1.4	2.3	5	45	27	45	30	30	30	61	PSO [6]
PSO_Bounds	1	2.1	1.8	22	33	20	17	17	17	20	PSO_Bounds [7]
Monte Carlo	1.2	2.1	1.8	2.1	12	110	130	130	130	1300	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.2	110	27	8.5	2.3	2.1	2	2	2	2.5	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.3	2.5	2.3	5.7	12	<i>75e-2/2e3</i>	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	2.9	53	13	9.8	7.9	13	13	13	15	VNS (Garcia) [10]

Table 45: 03-D, running time excess ERT/ERT_{best} on f_{115} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	115 Step-ellipsoid Cauchy										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.933	3.87	39.5	198	280	297	297	297	415	ERT_{best}/D
ALPS	1.1	2.1	6.9	7.8	4	49	66	66	66	200	ALPS [15]
AMaLGaM IDEA	1.3	1.6	3.2	1	4.7	6.8	8.2	8.2	8.2	6.9	AMaLGaM IDEA [4]
avg NEWUOA	1.5	3.1	1.1	2.6	4.9	19	45	45	45	59	avg NEWUOA [23]
BayEDAcG	1.1	2	4.4	7.9	31	48	96	96	96	69	BayEDAcG [9]
BFGS	11	68	190	<i>50e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.7	3.5	2.9	1.5	2.3	3.8	4.1	4.1	4.1	3.6	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.8	2.2	4.8	4.8	4.7	30	49	49	49	78	(1+1)-CMA-ES [2]
DASA	5	110	380	480	870	5300	1.4e4	1.4e4	1.4e4	<i>11e-3/9e5</i>	DASA [18]
DEPSO	1.6	4.8	7.4	3.4	5	5.2	6.1	6.1	6.1	6.5	DEPSO [11]
EDA-PSO	1.1	2.4	3.6	2.6	41	100	320	320	320	490	EDA-PSO [5]
full NEWUOA	1.9	2.6	1.4	1.8	2.7	15	26	26	26	28	full NEWUOA [23]
GLOBAL	1.5	1.6	3.9	4.6	3.8	31	<i>41e-3/600</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.3	1.6	2.1	12	7.1	8	10	10	10	8.6	iAMaLGaM IDEA [4]
MA-LS-Chain	1.1	2	5.8	2.6	1.9	4.6	6.2	6.2	6.2	6.6	MA-LS-Chain [19]
MCS (Neum)	1	1	1	3.2	48	850	<i>39e-3/2e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	2.4	2.8	1	4	8.3	66	220	220	220	150	NEWUOA [23]
(1+1)-ES	1.1	2.1	3	2.8	6.1	24	53	53	53	130	(1+1)-ES [1]
PSO	1.3	1.8	4.4	4.1	96	280	580	580	580	1e3	PSO [6]
PSO_Bounds	1.3	1.9	4.4	390	190	430	570	570	570	410	PSO_Bounds [7]
Monte Carlo	1	3.3	7.2	21	59	1700	5100	5100	5100	<i>32e-4/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.7	3	2.9	1.3	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.2	1.9	2	5.3	11	85	81	81	81	58	SNOBFIT [17]
VNS (Garcia)	1	3	6.9	2.5	2.2	1.9	2	2	2	1.5	VNS (Garcia) [10]

Table 46: 03-D, running time excess ERT/ERT_{best} on f_{116} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

116 Ellipsoid Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	6.2	25.3	56.2	881	1470	2050	2380	3150	3200	3790	ERT_{best}/D
ALPS	1.8	2.5	9.4	1.6	2.9	3.9	5.3	6	9.2	14	ALPS [15]
AMaLGaM IDEA	1.6	1.2	1	1.7	1.4	1	1	1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	19	24	65	28	<i>30e-1/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.9	7.8	24	6.9	9.5	<i>49e-1/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	35	36	300	<i>73e+0/1e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.5	3.1	8.8	2.4	3.4	3	3.1	2.4	2.4	2.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	6.2	6	16	6.7	19	72	<i>23e-2/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	140	190	530	280	2800	<i>19e-2/9e5</i>	.	.	.	.	DASA [18]
DEPSO	1.7	2.6	4.9	1.1	2.3	4.5	6.1	<i>15e-2/2e3</i>	.	.	DEPSO [11]
EDA-PSO	1.7	2.6	17	3.5	30	61	170	130	130	110	EDA-PSO [5]
full NEWUOA	32	17	35	14	68	49	<i>13e-1/7e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	2.2	2.5	7.2	2.8	3.5	5.7	4.9	<i>21e-1/700</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.1	1	5.3	1	1	1.1	1.6	1.2	1.3	1.2	iAMaLGaM IDEA [4]
MA-LS-Chain	1.8	1.9	8.3	2.1	4.4	8.1	14	11	13	29	MA-LS-Chain [19]
MCS (Neum)	1.8	1.5	4.2	5.3	37	<i>26e-2/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	12	18	45	41	50	<i>49e-1/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	11	10	19	7.8	23	70	410	<i>92e-5/1e6</i>	.	.	(1+1)-ES [1]
PSO	1.4	1.5	280	45	120	150	600	460	450	390	PSO [6]
PSO_Bounds	1.7	1.8	290	100	110	100	280	<i>31e-2/1e5</i>	.	.	PSO_Bounds [7]
Monte Carlo	2.5	7	48	87	1300	<i>13e-2/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	54	22	22	3.6	3	2.6	2.3	1.8	1.7	1.6	IPOP-SEP-CMA-ES [21]
SNOBFIT	2	3	14	13	8	5.8	<i>24e-1/2e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	4.7	43	10	13	11	15	16	17	15	VNS (Garcia) [10]

Table 47: 03-D, running time excess ERT/ERT_{best} on f_{117} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

117 Ellipsoid unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	6.2	76.6	797	4790	13200	18800	20600	23500	24600	26700	ERT_{best}/D
ALPS	1.5	1.8	1	1	1.2	3.2	4.8	9.7	30	450	ALPS [15]
AMaLGaM IDEA	2	16	5.8	2.6	2.4	4.5	5.5	7.9	13	23	AMaLGaM IDEA [4]
avg NEWUOA	66	48	33	<i>44e+0/6e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	2.5	12	36	<i>44e+0/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	12	7.1	11	<i>52e+0/600</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	18	6.4	2.9	1.1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	27	6.3	6	5.1	<i>28e-1/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	310	110	85	160	440	<i>49e-2/8e5</i>	.	.	.	.	DASA [18]
DEPSO	3.3	3.2	4.7	6.1	<i>12e+0/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1.5	1.1	2.5	8.9	17	75	69	61	<i>64e-2/1e5</i>	.	EDA-PSO [5]
full NEWUOA	62	22	22	<i>17e+0/7e3</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	2.3	2.2	2.6	<i>11e+0/1e3</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	20	19	5.8	2.6	3	4.5	6.9	7.6	8.8	16	iAMaLGaM IDEA [4]
MA-LS-Chain	1.8	2.2	1.5	1.7	2.9	5.8	11	<i>28e-2/2e4</i>	.	.	MA-LS-Chain [19]
MCS (Neum)	2	1.1	2	8.4	18	<i>19e-1/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	46	27	96	<i>23e+0/5e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	24	9	7.2	7.1	40	170	<i>43e-3/1e6</i>	.	.	.	(1+1)-ES [1]
PSO	2	1	13	16	<i>32e-2/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	2.4	1.7	47	25	22	36	34	61	<i>17e-1/1e5</i>	.	PSO_Bounds [7]
Monte Carlo	1.4	1.4	3	10	360	<i>17e-2/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	57	13	4.2	3.7	11	8	<i>12e-1/1e4</i>	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.3	1.7	2.2	<i>98e-1/2e3</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	30	7.4	3.3	8.6	27	140	920	2500	<i>19e-5/9e6</i>	VNS (Garcia) [10]

Table 48: 03-D, running time excess ERT/ERT_{best} on f_{118} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

118 Ellipsoid Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	4.6	6.8	36.3	68.2	237	284	336	392	428	531	ERT_{best}/D
ALPS	3.6	20	14	19	13	280	4100	<i>83e-5/2e6</i>	.	.	ALPS [15]
AMaLGaM IDEA	1.4	3.6	1.3	1	4.8	6.5	8.4	12	20	41	AMaLGaM IDEA [4]
avg NEWUOA	1	1.4	1	5	5.4	26	77	<i>43e-4/6e3</i>	.	.	avg NEWUOA [23]
BayEDAcG	2.8	30	110	130	<i>15e+0/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	37	89	60	220	<i>37e-1/3e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	2.8	7.3	4.6	5.1	2.3	2.3	2.2	2.1	2.1	1.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.7	4.5	3.1	5.1	7.1	100	<i>14e-3/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	36	240	250	1600	4300	1.7e4	<i>60e-3/1e6</i>	.	.	.	DASA [18]
DEPSO	3.5	10	8.1	18	22	<i>21e-2/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	2.8	9.8	25	45	160	490	2e3	<i>12e-3/1e5</i>	.	.	EDA-PSO [5]
full NEWUOA	1	1	1	2.7	5.8	18	140	<i>58e-4/7e3</i>	.	.	full NEWUOA [23]
GLOBAL	4.1	12	3.3	2.8	1.8	13	<i>27e-3/400</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.7	2.9	1	7.5	4	5.4	20	30	51	84	iAMaLGaM IDEA [4]
MA-LS-Chain	2.3	7	4.8	6.9	4.2	5.8	14	22	32	61	MA-LS-Chain [19]
MCS (Neum)	2.5	7.4	6.3	76	510	<i>25e-2/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1.3	1.4	1.7	3.7	6.5	43	110	<i>19e-3/5e3</i>	.	.	NEWUOA [23]
(1+1)-ES	4.2	7.3	11	20	52	230	3800	1.8e4	<i>93e-5/1e6</i>	.	(1+1)-ES [1]
PSO	2.1	6.3	10	760	1200	4900	4200	<i>42e-2/1e5</i>	.	.	PSO [6]
PSO_Bounds	2.4	7.8	12	1e3	850	1500	4400	<i>68e-2/1e5</i>	.	.	PSO_Bounds [7]
Monte Carlo	1.9	18	69	1e3	2e4	<i>16e-2/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.9	7.8	6.5	5.1	1.7	1.6	1.7	1.6	1.6	1.4	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.6	6.2	9.2	58	99	<i>15e-1/2e3</i>	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1.3	6.8	3.1	2.9	1	1	1	1	1	1	VNS (Garcia) [10]

Table 49: 03-D, running time excess ERT/ERT_{best} on f_{119} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

119 Sum of different powers Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	0.733	22.1	140	203	668	1890	4010	5240	ERT_{best}/D
ALPS	1	1.3	2.4	2.7	3.9	6.3	3.4	2.3	3.3	58	ALPS [15]
AMaLGaM IDEA	1	1.1	1.7	19	3.3	2.6	4.5	2.1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	1	1	23	8.2	16	51	<i>13e-3/6e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.1	2	5.8	2.4	3.5	2.3	5.2	<i>47e-5/2e3</i>	.	BayEDAcG [9]
BFGS	1	5	90	93	310	<i>69e-2/3e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.1	3.3	2.5	1	1	1.2	1.5	2.5	2.8	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	12	11	6.9	11	21	18	<i>24e-4/1e4</i>	.	(1+1)-CMA-ES [2]
DASA	1	44	280	460	410	2700	1.9e4	<i>58e-4/9e5</i>	.	.	DASA [18]
DEPSO	1	1	2.1	2.4	1.4	2.2	1	1	1.8	<i>33e-6/2e3</i>	DEPSO [11]
EDA-PSO	1	1.1	1.5	1	2.6	14	7.9	4.1	2.5	130	EDA-PSO [5]
full NEWUOA	1	1.9	3.9	7.6	18	41	150	<i>87e-4/7e3</i>	.	.	full NEWUOA [23]
GLOBAL	1	1.3	2.1	1.8	2.8	7.3	6.4	<i>56e-3/600</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	2.3	11	4.8	13	5.1	3	1.7	2.1	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.2	2.4	1.6	2.2	3.4	1.6	1.2	1.5	42	MA-LS-Chain [19]
MCS (Neum)	1	1	6.6	1.3	3.8	91	350	130	<i>94e-4/2e4</i>	.	MCS (Neum) [16]
NEWUOA	1	2.2	13	18	27	120	110	<i>31e-3/5e3</i>	.	.	NEWUOA [23]
(1+1)-ES	1	2.4	12	5.2	5.1	22	30	110	420	<i>11e-6/1e6</i>	(1+1)-ES [1]
PSO	1	1.2	1.6	1.6	1.4	2.4	2	6.2	24	280	PSO [6]
PSO_Bounds	1	1.1	2.4	1.8	2.5	7.1	4.8	7.4	16	130	PSO_Bounds [7]
Monte Carlo	1	1.1	1.4	2.6	33	990	<i>35e-4/1e6</i>	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	2.1	3.9	17	3.7	3.9	2.7	1.9	1.2	1.1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.2	2.2	2.6	3.1	5.8	8.5	6.2	6.2	<i>38e-4/2e3</i>	SNOBFIT [17]
VNS (Garcia)	1	1	1	27	4.7	4.7	3.3	3	4.1	110	VNS (Garcia) [10]

Table 50: 03-D, running time excess ERT/ERT_{best} on f_{120} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

120 Sum of different powers unif												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.333	0.333	0.733	26.8	601	2310	10600	25300	40100	88600	ERT_{best}/D	
ALPS	1	1.3	2.4	2.3	2.1	3.4	2.1	3	11	<i>18e-7/2e6</i>	ALPS [15]	
AMaLGaM IDEA	1	1.2	2.5	38	20	17	12	24	76	<i>28e-6/1e6</i>	AMaLGaM IDEA [4]	
avg NEWUOA	1	24	120	66	40	<i>36e-2/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.3	1.9	20	47	<i>43e-2/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	1	6.1	48	50	<i>10e-1/900</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	22	10	1.5	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	2.3	47	23	8.9	64	<i>53e-3/1e4</i>	.	.	.	(1+1)-CMA-ES [2]	
DASA	1	2.6	260	440	330	5400	<i>47e-3/8e5</i>	.	.	.	DASA [18]	
DEPSO	1	1.2	2.2	2.8	6.4	<i>11e-2/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.9	2.5	2.4	6	4.6	12	<i>19e-5/1e5</i>	.	EDA-PSO [5]	
full NEWUOA	1	3.1	140	74	85	<i>25e-2/7e3</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.1	1.6	2.3	4.9	8.1	<i>13e-2/1e3</i>	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	1	1	2.2	56	21	15	17	48	110	160	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1.2	2.4	1.3	1	2.1	1.5	<i>57e-5/2e4</i>	.	.	MA-LS-Chain [19]	
MCS (Neum)	1	1	6.6	4.3	6.5	31	<i>38e-3/2e4</i>	.	.	.	MCS (Neum) [16]	
NEWUOA	1	1.7	120	62	62	<i>42e-2/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1.4	34	18	13	90	660	<i>25e-4/1e6</i>	.	.	(1+1)-ES [1]	
PSO	1	1.1	1.9	1	21	15	8.4	12	37	<i>58e-5/1e5</i>	PSO [6]	
PSO_Bounds	1	1.3	2.3	270	43	20	13	18	36	<i>12e-4/1e5</i>	PSO_Bounds [7]	
Monte Carlo	1	1.1	1.7	2	7.1	150	<i>44e-4/1e6</i>	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	1	180	32	9.4	4.7	4.5	<i>61e-4/1e4</i>	.	.	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1.3	1.9	6.5	4.2	<i>12e-2/2e3</i>	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	130	17	16	17	89	770	<i>16e-6/9e6</i>	VNS (Garcia) [10]	

Table 51: 03-D, running time excess ERT/ERT_{best} on f_{121} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

$\Delta\text{ftarget}$ ERT_{best}/D	121 Sum of different powers Cauchy										$\Delta\text{ftarget}$ ERT_{best}/D
	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	
ALPS	1	1.2	1.9	3.4	13	110	1500	2.3e4	<i>27e-5/2e6</i>	.	ALPS [15]
AMaLGaM IDEA	1	1.3	2.2	1.3	8	25	15	36	54	140	AMaLGaM IDEA [4]
avg NEWUOA	1	2.3	2.9	3.5	5.3	27	320	<i>47e-4/5e3</i>	.	.	avg NEWUOA [23]
BayEDAcG	1	1.3	2.5	4.4	25	14	8.7	28	<i>31e-5/2e3</i>	.	BayEDAcG [9]
BFGS	1	1	60	21	30	60	100	95	<i>12e-3/3e3</i>	.	BFGS [22]
BIPOP-CMA-ES	1	1	3.4	1	1	1	1	1.5	1.9	2.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.9	1.8	1.8	7.2	47	290	<i>44e-4/1e4</i>	.	.	(1+1)-CMA-ES [2]
DASA	1	15	270	220	1900	4.3e4	<i>25e-3/9e5</i>	.	.	.	DASA [18]
DEPSO	1	1	2.3	2.3	5	6	23	58	<i>12e-4/2e3</i>	.	DEPSO [11]
EDA-PSO	1	1.3	2.2	1.8	15	630	<i>51e-4/1e5</i>	.	.	.	EDA-PSO [5]
full NEWUOA	1	2.2	4.2	2.3	3.4	6.8	88	<i>18e-4/6e3</i>	.	.	full NEWUOA [23]
GLOBAL	1	1.1	1.4	3.7	5.5	29	<i>12e-3/800</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	3.1	19	7.6	20	25	78	79	220	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.1	1.7	2.1	3.8	5.7	10	18	67	<i>43e-6/2e4</i>	MA-LS-Chain [19]
MCS (Neum)	1	1	2.1	1.4	45	2800	<i>22e-3/2e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.2	3.2	3.6	7.7	43	<i>62e-4/5e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	1	1.1	5	1.4	7.9	46	640	<i>24e-5/1e6</i>	.	.	(1+1)-ES [1]
PSO	1	1.1	2.8	1.6	14	780	6300	<i>20e-4/1e5</i>	.	.	PSO [6]
PSO_Bounds	1	1.2	2.4	2.1	210	2200	<i>16e-3/1e5</i>	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.2	2.4	3.7	100	2200	6.1e4	<i>31e-4/1e6</i>	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.1	4.8	1.1	1.2	1.2	1.5	1.3	1.1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.2	2.3	1	8.5	32	49	<i>10e-3/2e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	2.7	2.2	1.8	1.2	1	1	1.1	VNS (Garcia) [10]

Table 52: 03-D, running time excess ERT/ERT_{best} on f_{122} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

122 Schaffer F7 Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	1.93	119	601	1440	2530	3460	4080	6340	ERT_{best}/D
ALPS	1	1.2	1	3	3.6	3.4	3.2	3.5	4.9	12	ALPS [15]
AMaLGaM IDEA	1	1.2	2	2.2	5.2	3.2	2.7	2.7	2.4	3.8	AMaLGaM IDEA [4]
avg NEWUOA	1	2.1	13	22	<i>37e-2/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.4	1.4	2.1	3.1	<i>67e-3/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	1	44	43	<i>21e-1/3e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.1	28	2.3	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	18	10	35	<i>11e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	48	64	390	1e4	<i>21e-2/8e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1.6	3.7	2	2.4	6.8	<i>23e-3/2e3</i>	.	.	.	DEPSO [11]
EDA-PSO	1	1.2	1.9	3.1	5.4	4.6	6.9	8.5	11	11	EDA-PSO [5]
full NEWUOA	1	2.1	14	12	<i>32e-2/7e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.1	3	3.1	25	<i>52e-2/1e3</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.5	1.6	5.1	12	10	6.9	7.4	6.9	6.9	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.5	1.5	1.6	2.6	2.8	2.7	2.6	3.8	<i>15e-7/2e4</i>	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1.7	84	<i>16e-2/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.1	8.5	21	120	<i>65e-2/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1.5	12	8.4	50	1300	5600	<i>12e-3/1e6</i>	.	.	(1+1)-ES [1]
PSO	1	1.1	1.1	1	27	29	26	29	28	51	PSO [6]
PSO_Bounds	1	1.2	2.2	130	120	67	50	48	45	72	PSO_Bounds [7]
Monte Carlo	1	1.3	1	6.6	1e3	<i>79e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.4	57	3.2	3.6	2.3	2.5	2.7	2.4	3.5	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.2	2.2	3	5.6	17	9.9	<i>27e-2/2e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1.8	8.9	9.4	9	11	28	160	2600	VNS (Garcia) [10]

Table 53: 03-D, running time excess ERT/ERT_{best} on f_{123} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

123 Schaffer F7 unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	1.64	515	7280	16700	31100	43100	63600	1.47e5	ERT_{best}/D
ALPS	1	1.2	1.2	1.2	4	220	<i>12e-3/2e6</i>	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.2	2.7	32	21	420	<i>20e-3/1e6</i>	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	12	120	33	<i>16e-1/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.1	2.4	55	<i>19e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	5.3	27	23	<i>22e-1/900</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.2	32	1.4	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.6	29	8.5	<i>60e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	6.9	300	88	1700	<i>24e-2/8e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1.3	1.3	5.5	<i>11e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.1	2.5	2.2	17	<i>88e-3/1e5</i>	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	15	140	47	<i>14e-1/7e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1.1	1.1	1.2	1.2	<i>59e-2/1e3</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.5	1	18	30	150	<i>19e-3/1e6</i>	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.5	1.7	1.1	7.2	<i>12e-2/2e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	4.2	3.2	<i>43e-2/2e4</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	12	130	20	<i>12e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	14	36	6.6	110	<i>72e-3/1e6</i>	.	.	.	.	(1+1)-ES [1]
PSO	1	1.2	2.4	31	22	88	<i>12e-2/1e5</i>	.	.	.	PSO [6]
PSO_Bounds	1	1.3	2	15	20	<i>11e-2/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1.1	1.3	1.9	1	94	<i>79e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.7	15	9.1	<i>37e-2/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.1	1.1	1.9	1.7	<i>77e-2/2e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.1	11	31	570	2100	<i>79e-4/9e6</i>	.	.	VNS (Garcia) [10]

Table 54: 03-D, running time excess ERT/ERT_{best} on f_{124} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

$\Delta ftarget$ ERT_{best}/D	124 Schaffer F7 Cauchy											$\Delta ftarget$ ERT_{best}/D
	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07		
ALPS	1	1.2	2	4.7	27	2.1e4	<i>17e-3/2e6</i>	.	.	.	ALPS [15]	
AMaLGaM IDEA	1	1.2	2	1	3.9	4.8	10	29	54	160	AMaLGaM IDEA [4]	
avg NEWUOA	1	1.5	11	7.7	59	<i>18e-2/5e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.4	2.8	1.4	2.9	1.9	<i>34e-4/2e3</i>	.	.	.	BayEDAcG [9]	
BFGS	1	14	94	81	<i>10e-1/3e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.1	2.5	1.5	1	1.2	1.3	1.3	1.3	2.3	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	1	17	4.1	34	<i>77e-3/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	5.7	330	250	4.1e4	<i>19e-2/9e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1.2	3.8	2.2	4	<i>34e-3/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1.1	1.2	2	1.4	230	<i>47e-3/1e5</i>	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	3	11	2.6	17	<i>92e-3/6e3</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.4	1.9	3.6	<i>30e-2/600</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	2.2	3.8	11	11	19	52	110	180	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1.5	2.4	1.5	2.7	58	89	<i>36e-3/2e4</i>	.	.	MA-LS-Chain [19]	
MCS (Neum)	1	1	1	6.6	170	<i>15e-2/2e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.5	5.6	13	36	<i>14e-2/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1.5	10	2.6	29	1900	<i>12e-3/1e6</i>	.	.	.	(1+1)-ES [1]	
PSO	1	1.4	2.1	1.6	360	<i>84e-3/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1	1.1	2.3	3.9	730	<i>26e-2/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.1	3.3	11	4500	<i>96e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.3	4.3	3.4	1.1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1.1	2	1.7	76	<i>23e-2/2e3</i>	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.9	1.1	4	14	12	52	260	890	VNS (Garcia) [10]	

Table 55: 03-D, running time excess ERT/ERT_{best} on f_{125} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

125 Griewank-Rosenbrock Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	0.333	0.333	0.333	1290	8230	11700	12100	12700	ERT_{best}/D
ALPS	1	1	1.1	9.5	520	1.1	1.4	1.6	1.7	2.7	ALPS [15]
AMaLGaM IDEA	1	1	1.2	6.7	100	4.3	2.9	2.1	2	1.9	AMaLGaM IDEA [4]
avg NEWUOA	1	1	1.4	9.3	330	1.8	3	6.9	6.7	<i>40e-4/6e3</i>	avg NEWUOA [23]
BayEDAcG	1	1	1	9.6	310	2.3	<i>92e-4/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	1	1	6.3	170	1.2e4	<i>85e-3/4e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.1	9.3	590	1.8	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.3	76	770	3.9	5.2	5.9	12	<i>48e-4/1e4</i>	(1+1)-CMA-ES [2]
DASA	1	1	14	1900	1.4e4	140	330	510	990	<i>28e-4/9e5</i>	DASA [18]
DEPSO	1	1	1.6	11	540	1.9	3.6	<i>67e-4/2e3</i>	.	.	DEPSO [11]
EDA-PSO	1	1	1.2	9.5	280	2.6	4	12	20	52	EDA-PSO [5]
full NEWUOA	1	1	2.1	11	280	1.2	3.7	8.4	<i>25e-4/7e3</i>	.	full NEWUOA [23]
GLOBAL	1	1	1.2	8.3	420	2	2.2	<i>13e-3/1e3</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.1	7.7	1500	6.7	6.3	7.2	7	7.4	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	7.8	240	1.5	1.2	1.7	2.8	5.7	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	1.9	<i>20e-4/2e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	2.8	10	330	1	2.8	2	1.9	<i>19e-4/5e3</i>	NEWUOA [23]
(1+1)-ES	1	1	2.1	68	730	3.5	7.9	22	30	240	(1+1)-ES [1]
PSO	1	1	1.2	16	440	10	36	57	55	52	PSO [6]
PSO_Bounds	1	1	1.1	9.1	750	9.8	6.3	7.2	11	34	PSO_Bounds [7]
Monte Carlo	1	1	1	12	710	17	51	1200	<i>31e-5/1e6</i>	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	11	510	3.6	18	13	12	<i>37e-4/1e4</i>	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.3	15	350	2.4	<i>17e-3/2e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1.4	23	230	5.1	5.9	7.8	11	22	VNS (Garcia) [10]

Table 56: 03-D, running time excess ERT/ERT_{best} on f_{126} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

126 Griewank-Rosenbrock unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	0.333	0.333	0.333	4500	37700	1.11e5	2.08e5	3.2e5	ERT_{best}/D
ALPS	1	1	1.1	8	650	1.3	3.4	3.4	2.3	5.7	ALPS [15]
AMaLGaM IDEA	1	1	1.3	8	4800	4.2	6.4	40	67	<i>21e-5/1e6</i>	AMaLGaM IDEA [4]
avg NEWUOA	1	1	1.7	260	6200	<i>49e-3/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.3	12	5700	6.3	<i>95e-3/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	1	1	3.9	67	5200	<i>10e-2/900</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	16	970	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	160	1500	4.7	<i>12e-3/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	9.3	660	2.6e4	130	<i>50e-4/8e5</i>	.	.	.	DASA [18]
DEPSO	1	1	1.3	12	1500	3.3	<i>23e-3/2e3</i>	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.2	9.7	910	4.4	8.5	6.4	<i>15e-4/1e5</i>	.	EDA-PSO [5]
full NEWUOA	1	1	16	250	1.1e4	<i>63e-3/7e3</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	7.9	520	<i>34e-3/1e3</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1	16	3600	3.2	12	15	33	45	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	8.9	270	1	5.9	2	<i>25e-4/2e4</i>	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	5.1	<i>10e-3/2e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	13	270	8600	17	<i>48e-3/5e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	1.3	68	1400	5	17	28	72	<i>55e-5/1e6</i>	(1+1)-ES [1]
PSO	1	1	1.3	6.5	760	5.7	38	13	<i>43e-4/1e5</i>	.	PSO [6]
PSO_Bounds	1	1	1.1	12	4.6e4	13	8.3	13	7.2	<i>27e-4/1e5</i>	PSO_Bounds [7]
Monte Carlo	1	1	1	6.5	650	4.6	20	29	71	<i>28e-5/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	8.9	3200	5.7	4	1.4	<i>14e-3/1e4</i>	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.1	13	1100	1.6	<i>29e-3/2e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1.4	23	8200	9.6	19	17	23	130	VNS (Garcia) [10]

Table 57: 03-D, running time excess ERT/ERT_{best} on f_{127} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

127 Griewank-Rosenbrock Cauchy											
Δ_{ftarget}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δ_{ftarget}
ERT_{best}/D	0.333	0.333	0.333	0.333	0.333	1170	13000	15000	15100	15300	ERT_{best}/D
ALPS	1	1	1	13	490	8.1	19	94	770	<i>57e-6/2e6</i>	ALPS [15]
AMaLGaM IDEA	1	1	1.2	8.9	140	10	4.3	7.6	13	26	AMaLGaM IDEA [4]
avg NEWUOA	1	1	2.1	11	290	4.5	<i>61e-4/5e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.3	9.9	230	1	2.3	2	<i>72e-4/2e3</i>	.	BayEDAcG [9]
BFGS	1	1	1	190	5100	<i>51e-3/3e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	8.9	120	1.3	1	1.4	1.5	1.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.5	11	920	20	<i>16e-3/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	20	870	2.3e4	560	920	800	<i>62e-4/8e5</i>	.	DASA [18]
DEPSO	1	1	1.5	11	310	3.5	2.3	<i>11e-3/2e3</i>	.	.	DEPSO [11]
EDA-PSO	1	1	1.5	9	540	29	55	<i>30e-4/1e5</i>	.	.	EDA-PSO [5]
full NEWUOA	1	1	1.7	13	270	2.4	2	<i>44e-4/6e3</i>	.	.	full NEWUOA [23]
GLOBAL	1	1	1.3	7.7	640	14	<i>44e-3/1e3</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.2	11	2300	9.8	11	16	28	60	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	8.9	150	3.2	8.3	15	<i>36e-4/2e4</i>	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	7.3	<i>47e-4/2e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	2.1	18	280	1.6	2.3	4.3	4.2	<i>61e-4/4e3</i>	NEWUOA [23]
(1+1)-ES	1	1	1.1	48	1e3	12	27	160	460	<i>19e-5/1e6</i>	(1+1)-ES [1]
PSO	1	1	1.1	12	1400	36	<i>46e-4/1e5</i>	.	.	.	PSO [6]
PSO_Bounds	1	1	1.3	10	2.2e4	58	35	47	<i>67e-4/1e5</i>	.	PSO_Bounds [7]
Monte Carlo	1	1	1.1	13	590	20	61	450	450	<i>74e-5/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1.1	10	420	3	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.3	8.9	900	4.7	<i>29e-3/2e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1.4	23	290	20	12	20	23	24	VNS (Garcia) [10]

Table 58: 03-D, running time excess ERT/ERT_{best} on f_{128} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

128 Gallagher Gauss											
$\Delta\text{ftarget}$ ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$ ERT_{best}/D
ALPS	1	1	1.3	1	1.1	1.5	1.8	1.7	2.1	1.8	ALPS [15]
AMaLGaM IDEA	1	1	1.4	7.9	21	19	13	9.5	9.7	6.1	AMaLGaM IDEA [4]
avg NEWUOA	1	1	4.3	10	19	25	18	17	45	<i>45e-3/6e3</i>	avg NEWUOA [23]
BayEDAcG	1	1	1.5	3	7.1	33	47	<i>88e-3/2e3</i>	.	.	BayEDAcG [9]
BFGS	1	1	56	36	55	<i>12e-1/3e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	2.3	11	14	15	11	7.6	7.7	4.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.4	3	2.3	3.1	2.9	3.5	4.7	3.9	(1+1)-CMA-ES [2]
DASA	1	1	80	90	100	140	160	270	340	960	DASA [18]
DEPSO	1	1	1.7	3.9	4	3.7	2.7	2	2.1	1.4	DEPSO [11]
EDA-PSO	1	1	1.5	52	43	37	26	19	20	13	EDA-PSO [5]
full NEWUOA	1	1	9.9	5.9	4.1	6.1	4.5	4.3	6.2	35	full NEWUOA [23]
GLOBAL	1	1	1.4	1.1	1	1	1	1	1	1	GLOBAL [20]
iAMaLGaM IDEA	1	1	2.1	22	23	21	17	12	12	7.6	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1	1.1	1.8	2.5	2.1	1.8	2	1.3	MA-LS-Chain [19]
MCS (Neum)	1	1	4.8	1.4	1.3	3.9	5.5	22	59	<i>77e-6/2e4</i>	MCS (Neum) [16]
NEWUOA	1	1	1.7	7	9.1	14	35	84	<i>89e-4/5e3</i>	.	NEWUOA [23]
(1+1)-ES	1	1	4	5.6	3.7	4.1	3.9	3	3.2	5.3	(1+1)-ES [1]
PSO	1	1	1.6	110	76	67	47	34	34	22	PSO [6]
PSO_Bounds	1	1	1.4	110	68	58	41	30	30	20	PSO_Bounds [7]
Monte Carlo	1	1	2.1	1	2.5	18	49	190	1200	<i>84e-7/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	2.8	8.4	13	11	8.1	6.1	6.1	4.8	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.9	2	1.5	2.3	2.6	2.6	3.1	8.3	SNOBFIT [17]
VNS (Garcia)	1	1	2.2	29	26	22	15	11	11	7.1	VNS (Garcia) [10]

Table 59: 03-D, running time excess ERT/ERT_{best} on f_{129} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

129 Gallagher unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.333	0.333	1.6	121	1130	2620	3860	8260	9450	12800	ERT_{best}/D
ALPS	1	1	1	2.4	1	1.1	1.4	1	1	1	ALPS [15]
AMaLGaM IDEA	1	1	1.4	38	18	22	24	15	14	10	AMaLGaM IDEA [4]
avg NEWUOA	1	1	51	34	12	15	21	9.9	<i>23e-2/6e3</i>	.	avg NEWUOA [23]
BayEDAcG	1	1	1.8	15	25	<i>61e-2/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	1	1	26	9.1	5.4	<i>88e-2/900</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	3.3	5.8	1.8	1.1	1	3.1	3.5	2.7	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	2.9	16	4.1	7.5	8.5	18	<i>17e-3/1e4</i>	.	(1+1)-CMA-ES [2]
DASA	1	1	93	160	91	86	140	320	640	<i>20e-5/8e5</i>	DASA [18]
DEPSO	1	1	2.1	3.9	3.3	5.4	<i>11e-2/2e3</i>	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.5	1.8	17	18	18	13	12	9.3	EDA-PSO [5]
full NEWUOA	1	1	150	44	16	18	12	<i>50e-2/7e3</i>	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	1.6	1.2	2.5	<i>50e-3/1e3</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.7	56	7.5	5.8	7.8	6.7	6	7.1	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.7	1	1.8	1.6	1.7	1.8	1.9	2.5	MA-LS-Chain [19]
MCS (Neum)	1	1	6.3	3.3	2.1	4.1	10	29	25	<i>37e-4/2e4</i>	MCS (Neum) [16]
NEWUOA	1	1	56	63	21	30	21	<i>79e-2/5e3</i>	.	.	NEWUOA [23]
(1+1)-ES	1	1	7.2	6.2	3.1	3.1	5	9.7	31	200	(1+1)-ES [1]
PSO	1	1	1.8	150	61	51	41	26	23	22	PSO [6]
PSO_Bounds	1	1	1.8	130	60	44	31	19	17	13	PSO_Bounds [7]
Monte Carlo	1	1	1.7	1.6	1.1	1.7	6.8	20	150	1100	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	2.8	25	10	9.4	6.7	5.2	7.1	11	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	3.2	2.7	1.1	1	1.9	1.4	1.2	<i>22e-3/2e3</i>	SNOBFIT [17]
VNS (Garcia)	1	1	2.6	40	11	9.5	8.8	5	4.8	4.5	VNS (Garcia) [10]

Table 60: 03-D, running time excess ERT/ERT_{best} on f_{130} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	130 Gallagher Cauchy										
Δft_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δft_{target}
ERT_{best}/D	0.333	0.333	1.84	81.7	172	305	501	2260	3980	4780	ERT_{best}/D
ALPS	1	1	1.1	2.4	2.5	4.1	4.3	3.3	9	180	ALPS [15]
AMaLGaM IDEA	1	1	1.4	92	130	110	69	17	10	11	AMaLGaM IDEA [4]
avg NEWUOA	1	1	2.6	3.9	12	8.5	11	5.6	5.7	<i>90e-5/5e3</i>	avg NEWUOA [23]
BayEDAcG	1	1	1.4	5.7	33	27	17	3.8	7.2	6.2	BayEDAcG [9]
BFGS	1	1	34	33	63	<i>53e-2/3e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.9	24	44	44	46	10	5.9	4.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	2.2	6	7	8.8	15	4.4	8.3	30	(1+1)-CMA-ES [2]
DASA	1	1	41	130	230	740	790	800	1500	<i>14e-5/9e5</i>	DASA [18]
DEPSO	1	1	1.4	6.1	5.6	8	6.3	2.8	1.7	<i>63e-4/2e3</i>	DEPSO [11]
EDA-PSO	1	1	1.7	1.4	5.6	37	98	85	180	<i>15e-5/1e5</i>	EDA-PSO [5]
full NEWUOA	1	1	2.2	4.1	6.4	5.6	7.7	2.5	7	<i>53e-6/6e3</i>	full NEWUOA [23]
GLOBAL	1	1	1.3	1	1	1	1	1	1	2.6	GLOBAL [20]
iAMaLGaM IDEA	1	1	1	54	74	60	47	11	9	11	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	2.3	9.3	10	7.1	6.8	1.7	1	1.7	MA-LS-Chain [19]
MCS (Neum)	1	1	2.9	3.9	7.5	9.6	19	54	62	<i>36e-5/2e4</i>	MCS (Neum) [16]
NEWUOA	1	1	2	3	9.4	18	21	6.6	17	<i>86e-4/5e3</i>	NEWUOA [23]
(1+1)-ES	1	1	2.8	3.7	2.8	4.9	5.2	5.6	7	150	(1+1)-ES [1]
PSO	1	1	1.6	5.8	150	130	110	74	100	300	PSO [6]
PSO_Bounds	1	1	1.9	95	390	290	240	69	160	140	PSO_Bounds [7]
Monte Carlo	1	1	1.3	2.1	4.4	15	62	86	300	3e3	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1.9	5	23	15	9.2	2	1.2	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.4	4.6	5.8	12	15	<i>42e-3/2e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.2	83	100	61	52	11	9.9	9.5	VNS (Garcia) [10]

Table 61: 05-D, running time excess ERT/ERT_{best} on f_{101} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

101 Sphere moderate Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.2	0.2	2.2	7.39	8.83	9.8	12.4	13.1	13.8	15	ERT_{best}/D
ALPS	1	1.3	12	42	76	120	130	150	180	220	ALPS [15]
AMaLGaM IDEA	1	1.3	5.2	5.6	9.7	13	14	16	18	21	AMaLGaM IDEA [4]
avg NEWUOA	1	2.6	2.9	1.5	1.6	1.7	1.5	1.5	1.5	1.5	avg NEWUOA [23]
BayEDAcG	1	1.7	6.2	23	64	89	120	120	120	130	BayEDAcG [9]
BFGS	1	91	740	<i>70e-1/4e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.1	3.2	3.1	4.6	6	6.1	7.2	8	9.6	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.3	2.9	2	2.6	3.2	3.3	3.9	4.3	5.4	(1+1)-CMA-ES [2]
DASA	1	11	19	15	18	21	23	26	27	32	DASA [18]
DEPSO	1	1.3	7.5	11	16	21	23	28	31	38	DEPSO [11]
EDA-PSO	1	1.3	4.1	8	100	270	320	400	490	630	EDA-PSO [5]
full NEWUOA	1	3.4	3.3	1.3	1.3	1.2	1	1	1	1	full NEWUOA [23]
GLOBAL	1	1.3	11	8.1	7.7	7.4	6.1	6.2	6.2	6.4	GLOBAL [20]
iAMaLGaM IDEA	1	1.3	3.3	3.4	5.1	6.8	7.1	8.5	9.6	12	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	6.9	7.5	13	15	15	17	20	23	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	70	170	920	<i>82e-5/1e4</i>	.	.	MCS (Neum) [16]
NEWUOA	1	3.6	2.5	1.6	2.1	2.5	2.6	2.9	3	3.1	NEWUOA [23]
(1+1)-ES	1	2.5	2.9	1.8	2.4	3	3.1	3.4	3.8	4.6	(1+1)-ES [1]
PSO	1	1.3	4.2	7.8	17	29	36	46	57	76	PSO [6]
PSO_Bounds	1	1.2	4.9	13	53	110	140	190	220	330	PSO_Bounds [7]
Monte Carlo	1	1.7	9.8	460	1.9e5	<i>10e-2/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.9	4.2	3	4.1	4.9	5.2	5.8	6.4	7.7	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	2	1.1	1	1	1.1	1.3	1.5	1.8	SNOBFIT [17]
VNS (Garcia)	1	1.6	7.4	6.8	7.5	8.2	7.9	8.6	9.1	11	VNS (Garcia) [10]

Table 62: 05-D, running time excess ERT/ERT_{best} on f_{102} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

102 Sphere moderate unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.2	0.2	2.21	7.07	10	13.2	14.4	15.5	17.1	19.8	ERT_{best}/D
ALPS	1	1.2	6.6	51	73	92	110	130	150	170	ALPS [15]
AMaLGaM IDEA	1	1.3	5.7	6	7.6	8.7	10	12	13	15	AMaLGaM IDEA [4]
avg NEWUOA	1	1.3	2.7	1.4	1.5	1.4	1.5	1.5	1.6	1.5	avg NEWUOA [23]
BayEDAcG	1	1.3	12	23	59	110	120	120	120	130	BayEDAcG [9]
BFGS	1	29	890	<i>59e-1/3e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	2.7	3	4	4.3	5.1	6	6.3	7.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.1	2.5	2.3	2.5	2.6	3.1	3.5	3.7	4.2	(1+1)-CMA-ES [2]
DASA	1	61	41	23	22	23	26	30	32	38	DASA [18]
DEPSO	1	1.4	7.8	9	13	15	18	22	24	28	DEPSO [11]
EDA-PSO	1	1.5	4.9	8.3	96	180	270	330	390	470	EDA-PSO [5]
full NEWUOA	1	3.8	3.2	1.4	1.2	1	1	1	1	1	full NEWUOA [23]
GLOBAL	1	1.5	8.2	8.9	6.7	5.5	5.3	5.2	5	5.1	GLOBAL [20]
iAMaLGaM IDEA	1	1.3	2.8	2.8	4.2	4.9	6.1	7	7.5	8.5	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	6.9	8.2	12	12	13	16	16	17	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	120	500	9700	<i>58e-4/1e4</i>	.	.	MCS (Neum) [16]
NEWUOA	1	3.9	6.3	6	7	15	20	27	33	41	NEWUOA [23]
(1+1)-ES	1	3.9	2.9	2.1	2.2	2.3	2.7	3.1	3.3	3.9	(1+1)-ES [1]
PSO	1	1.3	4	10	15	23	31	39	45	55	PSO [6]
PSO_Bounds	1	1.6	4.1	15	47	82	120	150	180	250	PSO_Bounds [7]
Monte Carlo	1	1.1	4.2	430	1.7e5	<i>11e-2/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.1	3.1	2.9	3.2	3.6	4.1	4.8	5	5.7	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	2	1.2	1	1	1.3	1.5	1.7	2.1	SNOBFIT [17]
VNS (Garcia)	1	1.6	7.1	6.6	6	6.2	6.6	7.2	7.5	8.1	VNS (Garcia) [10]

Table 63: 05-D, running time excess ERT/ERT_{best} on f_{103} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	103 Sphere moderate Cauchy										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.2	0.2	2.2	5.52	5.96	5.96	6.25	6.4	6.99	23	ERT_{best}/D
ALPS	1	1.5	8.1	61	120	190	240	8300	<i>31e-6/1e6</i>	.	ALPS [15]
AMaLGaM IDEA	1	1.8	5	7	12	17	22	170	350	410	AMaLGaM IDEA [4]
avg NEWUOA	1	2.5	2.5	1.6	3.6	5.4	13	26	42	34	avg NEWUOA [23]
BayEDAcG	1	1.3	12	60	130	360	360	460	440	140	BayEDAcG [9]
BFGS	1	2.6	7.5	4.2	3.9	3.9	3.7	3.6	3.3	1	BFGS [22]
BIPOP-CMA-ES	1	1.7	3.5	4.7	7.4	10	13	15	17	6.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.2	2.4	2.5	4.2	6.9	29	110	360	1100	(1+1)-CMA-ES [2]
DASA	1	7.7	16	19	68	430	2700	1.3e5	1.7e6	<i>59e-6/9e5</i>	DASA [18]
DEPSO	1	1.5	12	14	25	40	70	180	410	<i>33e-7/2e3</i>	DEPSO [11]
EDA-PSO	1	1.1	4.2	11	120	470	1100	2.2e5	<i>38e-5/1e5</i>	.	EDA-PSO [5]
full NEWUOA	1	5.1	2.8	1.6	1.8	1.8	2.6	2.6	2.4	4.8	full NEWUOA [23]
GLOBAL	1	1.3	6.4	11	11	12	16	34	38	33	GLOBAL [20]
iAMaLGaM IDEA	1	1.3	2.7	4.5	7.5	12	55	140	380	700	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.5	6	11	19	26	33	44	49	22	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	100	100	130	130	130	230	MCS (Neum) [16]
NEWUOA	1	3.5	2.4	1.9	5.7	9.4	60	85	180	140	NEWUOA [23]
(1+1)-ES	1	3	3	2.4	3.6	5.2	27	120	530	3700	(1+1)-ES [1]
PSO	1	1.3	3.5	8.3	26	100	1400	4.7e4	<i>33e-5/1e5</i>	.	PSO [6]
PSO_Bounds	1	1.1	4.2	18	86	2800	1.5e4	<i>87e-5/1e5</i>	.	.	PSO_Bounds [7]
Monte Carlo	1	1.1	6.2	830	2.9e5	<i>10e-2/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.5	3.4	3.9	5.9	8.1	9.9	13	14	5.7	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.5	1.6	1	1	1	1	1	1	3.5	SNOBFIT [17]
VNS (Garcia)	1	1.6	7.5	8.6	11	13	16	19	20	7.9	VNS (Garcia) [10]

Table 64: 05-D, running time excess ERT/ERT_{best} on f_{104} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

104 Rosenbrock moderate Gauss												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	3.84	11.2	34.6	155	257	315	354	385	408	457	ERT_{best}/D	
ALPS	6.3	22	18	18	29	37	40	45	48	71	ALPS [15]	
AMaLGaM IDEA	3.3	3.1	2.1	3.6	2.8	2.6	2.5	2.4	2.4	2.3	AMaLGaM IDEA [4]	
avg NEWUOA	1.3	2.8	1	5	7.6	14	23	21	20	24	avg NEWUOA [23]	
BayEDAcG	6.8	8.8	21	180	<i>33e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]	
BFGS	350	<i>61e+1/2e3</i>	.	.	.	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	2.4	2.6	1.4	1.9	2	2	2	2	1.9	1.8	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1.7	2.2	1	3.7	4.1	4.8	4.4	4.1	3.9	3.5	(1+1)-CMA-ES [2]	
DASA	23	27	11	35	46	88	190	870	3200	1.5e4	DASA [18]	
DEPSO	7.6	7.9	4.4	10	55	<i>53e-2/2e3</i>	.	.	.	.	DEPSO [11]	
EDA-PSO	4.2	5.6	32	39	53	72	92	110	130	160	EDA-PSO [5]	
full NEWUOA	1.8	3.2	1.1	1.8	1.7	1.4	1.4	1.3	1.3	1.2	full NEWUOA [23]	
GLOBAL	6.4	5.3	2.2	2	3.4	3.7	3.3	3	2.9	2.6	GLOBAL [20]	
iAMaLGaM IDEA	2.1	2.3	1.5	1	1	1	1	1	1	1	iAMaLGaM IDEA [4]	
MA-LS-Chain	5	5.6	3.6	7.1	5.1	4.7	4.4	4.2	4.1	3.8	MA-LS-Chain [19]	
MCS (Neum)	1	1	1.5	920	<i>23e-1/1e4</i>	.	.	.	.	.	MCS (Neum) [16]	
NEWUOA	1.1	2.8	1.2	3.4	6	14	24	100	<i>14e-4/5e3</i>	.	NEWUOA [23]	
(1+1)-ES	2.2	2.6	1.1	4.3	12	25	63	230	980	9900	(1+1)-ES [1]	
PSO	3.3	5.1	5.7	170	190	1500	<i>22e-3/1e5</i>	.	.	.	PSO [6]	
PSO_Bounds	3.4	10	17	2600	5400	<i>15e-1/1e5</i>	.	.	.	.	PSO_Bounds [7]	
Monte Carlo	10	150	9e3	<i>64e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	2.4	15	5.4	14	8.7	7.7	7	6.4	6.1	5.5	IPOP-SEP-CMA-ES [21]	
SNOBFIT	2.4	2.1	1.3	91	<i>28e-1/1e3</i>	.	.	.	.	.	SNOBFIT [17]	
VNS (Garcia)	7.3	4.1	2	7.4	5.6	5.9	11	11	10	9	VNS (Garcia) [10]	

Table 65: 05-D, running time excess ERT/ERT_{best} on f_{105} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

105 Rosenbrock moderate unif												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	3.28	12.4	33.3	287	1030	2e3	2080	2130	2160	2240	ERT_{best}/D	
ALPS	13	26	22	7	5.1	4.6	6	7.8	9.4	17	ALPS [15]	
AMaLGaM IDEA	4	3.2	2.4	11	3.3	1.8	1.8	1.7	1.7	1.7	AMaLGaM IDEA [4]	
avg NEWUOA	1.4	3.7	1.7	2.4	1.9	4.4	14	47	46	<i>45e-4/7e3</i>	avg NEWUOA [23]	
BayEDAcG	5.8	10	28	<i>37e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]	
BFGS	410	<i>82e+1/1e3</i>	.	.	.	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	3	2.4	1.7	3.7	1.7	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	2.3	3.2	1.5	4.4	4.1	11	34	33	<i>16e-3/1e4</i>	.	(1+1)-CMA-ES [2]	
DASA	29	36	17	16	12	22	100	240	700	6600	DASA [18]	
DEPSO	6	6.2	5.3	16	14	<i>17e-1/2e3</i>	.	.	.	.	DEPSO [11]	
EDA-PSO	3.8	6.1	40	20	13	12	18	24	31	<i>38e-8/1e5</i>	EDA-PSO [5]	
full NEWUOA	2.2	4.2	1.7	1.6	4.5	9.3	31	61	<i>22e-3/9e3</i>	.	full NEWUOA [23]	
GLOBAL	10	4.8	2.2	1	1	<i>75e-2/200</i>	.	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	2.3	1.9	1.5	8	2.8	1.5	1.5	1.5	1.5	1.5	iAMaLGaM IDEA [4]	
MA-LS-Chain	6	5	3.9	58	44	33	32	31	31	30	MA-LS-Chain [19]	
MCS (Neum)	1.1	1	1.6	520	<i>32e-1/1e4</i>	.	.	.	.	.	MCS (Neum) [16]	
NEWUOA	1	2.8	1.7	2.7	3.3	5	<i>38e-3/5e3</i>	.	.	.	NEWUOA [23]	
(1+1)-ES	2.6	1.8	1	1.7	1.3	4.3	16	50	170	6500	(1+1)-ES [1]	
PSO	6.3	6.5	6.4	64	630	700	<i>70e-2/1e5</i>	.	.	.	PSO [6]	
PSO_Bounds	3.4	6.8	15	1400	1400	700	<i>15e-1/1e5</i>	.	.	.	PSO_Bounds [7]	
Monte Carlo	8.7	160	1.4e4	<i>69e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	3	1.8	1.3	18	5	2.6	2.6	2.5	2.5	2.4	IPOP-SEP-CMA-ES [21]	
SNOBFIT	2.5	4	2.5	49	14	<i>32e-1/1e3</i>	.	.	.	.	SNOBFIT [17]	
VNS (Garcia)	8.4	68	27	42	31	24	26	25	25	24	VNS (Garcia) [10]	

Table 67: 05-D, running time excess ERT/ERT_{best} on f_{107} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

107 Sphere Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.2	0.2	7.97	45.5	90.6	138	188	234	275	370	ERT_{best}/D
ALPS	1	1.4	2.7	10	12	13	13	14	14	15	ALPS [15]
AMaLGaM IDEA	1	1.3	1.7	5.8	18	12	11	13	11	11	AMaLGaM IDEA [4]
avg NEWUOA	1	2.7	68	320	<i>14e-1/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.4	2.5	6.7	7.1	7.7	7.7	10	27	<i>29e-6/2e3</i>	BayEDAcG [9]
BFGS	1	12	150	<i>61e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.4	1.7	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	21	42	210	<i>19e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	110	600	3e3	<i>3.6e4</i>	<i>29e-2/7e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1.6	3.3	3.1	3.6	3.9	3.7	4.3	5.2	5.4	DEPSO [11]
EDA-PSO	1	1.3	1.6	11	20	27	29	30	32	34	EDA-PSO [5]
full NEWUOA	1	6.1	85	250	1400	<i>96e-2/8e3</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.1	2.6	12	<i>77e-2/700</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.9	33	31	28	26	22	22	22	30	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.5	1.9	5	6.8	6.9	7	6.5	6	5	MA-LS-Chain [19]
MCS (Neum)	1	1	3.9	4.2	72	<i>81e-3/1e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	2.7	60	190	<i>17e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	3.3	31	59	650	6800	7.5e4	<i>50e-4/1e6</i>	.	.	(1+1)-ES [1]
PSO	1	1.3	1.3	2.6	4.3	4.8	6.6	9.1	9.8	10	PSO [6]
PSO_Bounds	1	1.7	1	5.4	32	67	100	89	83	70	PSO_Bounds [7]
Monte Carlo	1	1.9	4.5	48	<i>1.3e4</i>	<i>96e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.2	5.6	10	5.6	11	11	10	9.5	8.9	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.2	1.5	13	36	53	<i>14e-2/1e3</i>	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1.6	2.7	8	6.3	6.7	10	9.5	8.7	9.1	VNS (Garcia) [10]

Table 68: 05-D, running time excess ERT/ERT_{best} on f_{108} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

108 Sphere unif												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.2	0.2	17.3	1030	2890	4930	6190	8240	11700	16100	ERT_{best}/D	
ALPS	1	1.1	1.1	1	4.5	13	35	180	1200	<i>98e-6/1e6</i>	ALPS [15]	
AMaLGaM IDEA	1	1.7	75	12	17	20	31	73	170	450	AMaLGaM IDEA [4]	
avg NEWUOA	1	3	150	44	<i>27e-1/6e3</i>	.	.	.	.	.	avg NEWUOA [23]	
BayEDAcG	1	1.5	18	<i>34e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]	
BFGS	1	6.6	56	<i>84e-1/900</i>	.	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	1	1	6.1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	33	24	15	<i>12e-1/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]	
DASA	1	240	260	460	<i>65e-2/7e5</i>	.	.	.	.	.	DASA [18]	
DEPSO	1	1.1	2.3	9.3	<i>19e-1/2e3</i>	.	.	.	.	.	DEPSO [11]	
EDA-PSO	1	1.1	4.9	11	41	300	<i>38e-3/1e5</i>	.	.	.	EDA-PSO [5]	
full NEWUOA	1	89	78	<i>43e-1/9e3</i>	.	.	.	.	.	.	full NEWUOA [23]	
GLOBAL	1	1.2	1.4	3.6	<i>16e-1/900</i>	.	.	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	1	1.6	130	16	26	33	42	61	81	210	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1.7	1.3	1	3.9	17	<i>29e-3/2e4</i>	.	.	.	MA-LS-Chain [19]	
MCS (Neum)	1	1	15	6.1	51	<i>54e-2/1e4</i>	.	.	.	.	MCS (Neum) [16]	
NEWUOA	1	48	77	64	<i>41e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]	
(1+1)-ES	1	96	24	30	830	<i>12e-2/1e6</i>	.	.	.	.	(1+1)-ES [1]	
PSO	1	1.4	420	48	71	290	<i>54e-2/1e5</i>	.	.	.	PSO [6]	
PSO_Bounds	1	1.1	410	86	96	290	230	<i>69e-2/1e5</i>	.	.	PSO_Bounds [7]	
Monte Carlo	1	1.6	1	4.1	480	<i>98e-3/1e6</i>	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	1	100	6.7	7.6	9.7	<i>20e-2/1e4</i>	.	.	.	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1.5	3.5	6.5	5	<i>25e-1/1e3</i>	.	.	.	.	SNOBFIT [17]	
VNS (Garcia)	1	1.6	61	11	44	450	4900	<i>39e-4/7e6</i>	.	.	VNS (Garcia) [10]	

Table 69: 05-D, running time excess ERT/ERT_{best} on f_{109} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

109 Sphere Cauchy											
Δft_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δft_{target}
ERT_{best}/D	0.2	0.2	2.2	11.4	43.3	75	114	139	175	189	ERT_{best}/D
ALPS	1	1.7	5.2	28	42	3500	<i>43e-4/1e6</i>	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.3	3.7	3.4	19	20	36	40	71	170	AMaLGaM IDEA [4]
avg NEWUOA	1	1.5	4.3	3.6	26	47	<i>67e-4/6e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.3	8.6	41	24	24	22	20	17	19	BayEDAcG [9]
BFGS	1	18	39	13	3.4	2.5	1.7	1.4	1.1	1	BFGS [22]
BIPOP-CMA-ES	1	1.6	3.5	2.2	1.1	1	1.1	1.1	1.1	1.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	2.1	2.5	6.5	25	430	<i>20e-3/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	1	4.7	320	2800	4.3e4	<i>15e-2/7e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1.4	9.9	6.7	5.7	25	130	<i>51e-4/2e3</i>	.	.	DEPSO [11]
EDA-PSO	1	1.5	3.1	4.9	550	2e4	<i>30e-3/1e5</i>	.	.	.	EDA-PSO [5]
full NEWUOA	1	5.6	5.6	5	6.1	13	21	28	22	20	full NEWUOA [23]
GLOBAL	1	1.3	8.1	7	5.1	53	35	<i>49e-3/200</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.4	2.6	2.3	16	33	65	110	180	410	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.5	5.8	5.9	5.1	12	20	47	72	430	MA-LS-Chain [19]
MCS (Neum)	1	1	1	12	22	32	120	300	370	340	MCS (Neum) [16]
NEWUOA	1	1.7	4.8	13	83	880	<i>41e-3/5e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	1	2.5	2.7	5.4	13	290	1.4e4	<i>13e-4/1e6</i>	.	.	(1+1)-ES [1]
PSO	1	1.1	4.1	130	1400	2e4	<i>46e-3/1e5</i>	.	.	.	PSO [6]
PSO_Bounds	1	1.4	3.6	640	2700	1.9e4	<i>13e-2/1e5</i>	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.5	11	320	2.2e4	<i>88e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.7	4.1	2.3	1	1.1	1	1	1	1.2	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.5	2.4	1	3.6	16	35	100	<i>10e-3/1e3</i>	.	SNOBFIT [17]
VNS (Garcia)	1	1.6	7.3	4.2	1.6	1.5	1.3	1.4	1.3	1.8	VNS (Garcia) [10]

Table 70: 05-D, running time excess ERT/ERT_{best} on f_{110} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

110 Rosenbrock Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	9.69	48	190	6720	24000	1.12e5	1.19e5	1.19e5	1.21e5	1.22e5	ERT_{best}/D
ALPS	4.5	6.2	4.4	1	1	1	1.8	3.6	8.3	38	ALPS [15]
AMaLGaM IDEA	1.5	1	4.7	74	83	18	17	17	17	17	AMaLGaM IDEA [4]
avg NEWUOA	20	34	240	<i>27e+0/6e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	2.4	2.7	1.9	<i>30e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	92	<i>73e+1/1e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.3	2.2	1	4.8	3.7	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	8	13	20	22	<i>52e-1/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	550	1e3	3600	<i>92e-1/7e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	2.7	2.2	1.7	1	<i>20e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1.7	4.9	11	220	<i>23e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	28	37	140	<i>15e+0/8e3</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	2.7	5	9	<i>32e+0/400</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.1	5.6	4.7	9.1	46	12	17	20	20	25	iAMaLGaM IDEA [4]
MA-LS-Chain	1.8	2.2	1.9	11	15	<i>15e-1/2e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	2.1	3.1	8.3	<i>54e-1/1e4</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	17	23	120	10	<i>13e+0/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	13	16	21	33	<i>29e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	2.5	2.4	30	<i>17e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1.7	4	42	60	59	13	<i>20e-1/1e5</i>	.	.	.	PSO_Bounds [7]
Monte Carlo	3.1	31	1900	<i>63e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.2	3.9	2.9	6.1	<i>21e-1/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.7	7.2	8.5	2.1	<i>15e+0/1e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	3.4	1.5	3.4	8.8	11	9.7	28	50	160	<i>77e-6/7e6</i>	VNS (Garcia) [10]

Table 71: 05-D, running time excess ERT/ERT_{best} on f_{111} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

111 Rosenbrock unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	13.9	214	1370	1.22e5	1.77e6	4.59e6	4.61e6	4.62e6	6.2e6	6.26e6	ERT_{best}/D
ALPS	2.9	2.5	1.5	1	2.5	<i>34e-2/1e6</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1.3	3	6.6	4.5	<i>53e-2/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	140	60	<i>20e+1/6e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.8	4.1	<i>67e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	61	38	<i>10e+2/600</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.7	1.5	1	2.5	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	19	20	110	<i>44e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1e3	680	3500	<i>21e+0/7e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	3.2	2.9	22	<i>31e+0/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	3	3.5	5.4	<i>24e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	150	100	<i>16e+1/8e3</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	3.5	7.8	<i>12e+1/900</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.3	8.3	7.2	3.7	2.5	3.2	<i>26e-2/1e6</i>	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1.5	1	1.4	1.4	<i>19e-1/2e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	7.1	5	22	<i>12e+0/1e4</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	78	97	<i>36e+1/5e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	19	28	130	<i>45e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	2.6	35	38	3.4	<i>31e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	2.5	73	110	12	<i>14e+0/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	2.3	14	210	<i>66e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	85	13	4.9	<i>46e-1/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.1	8.7	<i>10e+1/1e3</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	83	21	11	3.6	5.4	20	<i>11e-2/6e6</i>	.	.	.	VNS (Garcia) [10]

Table 72: 05-D, running time excess ERT/ERT_{best} on f_{112} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

112 Rosenbrock Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	3.33	9.63	21.3	337	684	832	900	963	1030	1120	ERT_{best}/D
ALPS	9	29	33	19	330	<i>50e-3/1e6</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	3.9	3.6	3.5	30	190	270	260	330	380	350	AMaLGaM IDEA [4]
avg NEWUOA	1.5	2.5	3.1	4.9	23	110	<i>14e-2/7e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	4.9	8.2	46	<i>35e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	130	390	920	<i>92e+0/3e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	2.5	6.3	4	1	1.2	1.2	1.3	1.3	1.3	1.3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.1	3.9	3.2	6.8	100	<i>29e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	22	41	79	340	5600	<i>18e-2/9e5</i>	.	.	.	.	DASA [18]
DEPSO	6.8	6.1	7.4	40	44	<i>25e-1/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	5.2	12	62	<i>18e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	2	1.8	1	6.3	18	150	<i>93e-3/9e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	6.1	7	4.1	1.7	7	<i>16e-1/300</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.4	2.5	2.3	91	340	420	430	460	440	570	iAMaLGaM IDEA [4]
MA-LS-Chain	6.4	6.3	5.4	15	110	420	390	<i>28e-2/2e4</i>	.	.	MA-LS-Chain [19]
MCS (Neum)	1.1	1.4	41	<i>37e-1/1e4</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	1.9	7.7	110	<i>44e-2/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	2.6	2.7	2.4	4.5	65	2400	<i>14e-3/1e6</i>	.	.	.	(1+1)-ES [1]
PSO	4.1	5.8	8.4	1900	2e3	<i>15e-1/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	5.4	11	29	1200	<i>29e-1/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	12	160	1.9e4	<i>71e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	2.6	2.2	2	2.5	1.7	1.5	1.5	1.5	1.4	1.4	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.4	1.9	2.7	<i>34e-1/1e3</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	9.1	7.2	4.5	1.1	1	1	1	1	1	1	VNS (Garcia) [10]

Table 73: 05-D, running time excess ERT/ERT_{best} on f_{113} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

113 Step-ellipsoid Gauss											
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$
ERT_{best}/D	0.2	1.92	26.5	377	1620	4800	4830	4830	4830	4880	ERT_{best}/D
ALPS	1.3	1.2	5.9	2.6	2	1.1	1.5	1.5	1.5	1.6	ALPS [15]
AMaLGaM IDEA	1.3	1	1.2	4.6	2.4	1	1	1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	1.7	23	14	31	55	<i>13e-1/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.8	1.3	3.4	2.6	3.2	6.1	6.1	6.1	6.1	6	BayEDAcG [9]
BFGS	14	100	180	<i>24e+0/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	2.1	2.4	1.5	1.3	1.7	1.1	1.1	1.1	1.1	1.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.1	25	8.6	40	92	<i>96e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	6.3	220	540	2700	<i>11e-1/7e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1.3	3.5	3.1	1	1	1.1	1.4	1.4	1.4	1.4	DEPSO [11]
EDA-PSO	1.3	2.8	4.5	3.4	17	11	15	15	15	15	EDA-PSO [5]
full NEWUOA	2.3	28	19	57	<i>14e-1/8e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1.9	1.1	4.1	9.9	7.3	<i>18e-1/900</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.9	1.8	1	4.7	4.2	1.6	1.8	1.8	1.8	1.8	iAMaLGaM IDEA [4]
MA-LS-Chain	1.5	2.1	2.2	1.5	4.9	3.4	5.3	5.3	5.3	5.3	MA-LS-Chain [19]
MCS (Neum)	1	2	1.5	9	92	<i>48e-2/1e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	2.1	15	13	44	<i>18e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	2.2	12	13	32	230	1400	<i>23e-3/1e6</i>	.	.	.	(1+1)-ES [1]
PSO	1.5	1.8	470	180	420	<i>54e-2/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1.5	1.8	2.5	21	56	33	43	43	43	43	PSO_Bounds [7]
Monte Carlo	1.3	1.3	8.7	350	<i>31e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	2.5	74	16	6.7	3.3	1.2	1.3	1.3	1.3	1.3	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.2	2.3	7.7	18	<i>30e-1/1e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	2.3	28	13	13	7.3	15	15	15	15	VNS (Garcia) [10]

Table 74: 05-D, running time excess ERT/ERT_{best} on f_{114} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

Δft_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δft_{target} ERT_{best}/D
	114 Step-ellipsoid unif										
ALPS	1.3	1	1.2	1.6	7	35	63	63	63	96	ALPS [15]
AMaLGaM IDEA	1.6	1.4	17	7.1	5.7	14	19	19	19	20	AMaLGaM IDEA [4]
avg NEWUOA	1.3	110	74	<i>11e+0/6e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.2	1.3	6.9	<i>73e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	20	67	<i>28e+0/800</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.5	21	2.2	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.1	43	7.2	24	<i>29e-1/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	4.6	430	260	1100	<i>18e-1/7e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1.2	2.6	4.7	<i>42e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1.3	1.3	21	28	<i>73e-2/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1.1	180	60	<i>82e-1/8e3</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1.5	2	2.7	4.5	<i>45e-1/900</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.5	1.5	11	14	15	28	43	43	43	42	iAMaLGaM IDEA [4]
MA-LS-Chain	1.3	2.1	1.3	1.6	5.8	<i>29e-2/2e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	5	2.2	7.5	<i>13e-1/1e4</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	150	43	<i>89e-1/5e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	9.9	38	13	70	<i>29e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1.2	1.6	1	27	39	<i>73e-2/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1.4	1.9	100	140	130	<i>47e-1/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1.5	1.6	2.7	34	1300	<i>44e-2/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.3	130	15	4.6	12	<i>99e-2/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.5	2.7	3.5	<i>56e-1/1e3</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1.9	34	14	140	1200	5400	5400	5400	5300	VNS (Garcia) [10]

Table 75: 05-D, running time excess ERT/ERT_{best} on f_{115} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

115 Step-ellipsoid Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.2	2.01	12.7	97	366	455	510	510	510	594	ERT_{best}/D
ALPS	1.3	2.5	13	6.8	25	9600	1.3e4	1.3e4	1.3e4	<i>16e-3/1e6</i>	ALPS [15]
AMaLGaM IDEA	1.3	1.9	1.8	4.1	2.9	5.6	5	5	5	6.5	AMaLGaM IDEA [4]
avg NEWUOA	1.1	1.6	1.1	4.2	28	<i>10e-2/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.5	1.5	5.9	21	78	63	<i>89e-2/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	32	120	2200	<i>24e+0/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.3	1.7	1.5	2.6	6.5	6.6	5.9	5.9	5.9	5.7	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.3	1.4	4.7	7.4	43	<i>11e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	18	45	420	2700	<i>63e-2/8e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1.1	2.3	4.8	5.5	6.5	65	<i>58e-3/2e3</i>	.	.	.	DEPSO [11]
EDA-PSO	1.7	1.7	7.7	19	180	<i>65e-3/1e5</i>	.	.	.	.	EDA-PSO [5]
full NEWUOA	2.9	2	1	2.8	17	<i>57e-3/8e3</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1.2	1.2	4.4	4.7	<i>84e-2/300</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.1	1.3	1.6	4.2	8.7	19	20	20	20	18	iAMaLGaM IDEA [4]
MA-LS-Chain	1.3	1.5	3	3.2	30	72	150	150	150	280	MA-LS-Chain [19]
MCS (Neum)	1	1.4	1.4	43	400	<i>83e-2/1e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	2.1	1.2	2.9	14	42	<i>34e-2/4e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	1.9	2.1	1.7	11	64	3e3	1.4e4	1.4e4	1.4e4	2.5e4	(1+1)-ES [1]
PSO	1.5	1.3	2.6	190	580	<i>36e-2/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1.3	1	5.1	400	1100	<i>38e-2/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1.3	1.8	22	910	<i>34e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.4	1.4	1.5	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.1	1.4	4.6	17	<i>11e-1/1e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	2.1	3.4	1	4.4	5.7	5.3	5.3	5.3	5.2	VNS (Garcia) [10]

Table 76: 05-D, running time excess ERT/ERT_{best} on f_{116} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

116 Ellipsoid Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	22.9	268	1150	2890	4460	5250	5370	5520	6070	6330	ERT_{best}/D
ALPS	3.1	2.1	1.5	2.4	4.5	14	26	57	280	2300	ALPS [15]
AMaLGaM IDEA	1	1	1	1	1	1	1	1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	29	35	<i>95e+0/6e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	3	4.3	12	<i>37e+0/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	68	<i>12e+2/900</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.8	1.1	1.2	2	1.9	2.1	2.1	2.1	2	2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	8.1	13	37	<i>18e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	150	220	1300	<i>12e+0/7e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	2.6	1.5	1.9	4.7	3.2	<i>73e-1/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1.7	3.4	25	96	150	270	<i>18e-1/1e5</i>	.	.	.	EDA-PSO [5]
full NEWUOA	37	45	<i>10e+1/8e3</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	2.6	3.2	4.5	<i>94e+0/900</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	15	4	4	3.2	2.5	2.4	2.4	2.8	2.6	2.6	iAMaLGaM IDEA [4]
MA-LS-Chain	1.4	1	2.6	5.6	14	69	<i>37e-2/2e4</i>	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1.8	1.3	16	49	<i>12e+0/1e4</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	27	20	<i>74e+0/5e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	6.2	11	40	1600	<i>17e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	2.8	60	240	<i>15e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1.2	60	130	150	<i>19e+0/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	3.8	19	1700	<i>11e+0/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.9	6.3	4.5	2.5	2.7	2.3	2.3	2.2	2.1	2	IPOP-SEP-CMA-ES [21]
SNOBFIT	1.1	4.7	<i>83e+0/1e3</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	2	12	14	22	52	200	260	630	570	910	VNS (Garcia) [10]

Table 77: 05-D, running time excess ERT/ERT_{best} on f_{117} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

117 Ellipsoid unif												
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$	
ERT_{best}/D	34.5	865	5340	15200	21900	25700	27400	30300	34600	38300	ERT_{best}/D	
ALPS	1.4	1	3.1	9.3	79	570	<i>13e-2/1e6</i>	.	.	.	ALPS [15]	
AMaLGaM IDEA	1	5.9	5.6	5.9	8.4	9.9	15	27	45	370	AMaLGaM IDEA [4]	
avg NEWUOA	38	100	<i>30e+1/6e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]	
BayEDAcG	1.6	<i>21e+1/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]	
BFGS	18	<i>91e+1/600</i>	.	.	.	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	6.6	2.1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	24	11	28	<i>77e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]	
DASA	160	190	<i>39e+0/7e5</i>	.	.	.	.	.	.	.	DASA [18]	
DEPSO	3.7	7.2	<i>15e+1/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]	
EDA-PSO	1.2	15	28	<i>15e+0/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]	
full NEWUOA	160	45	<i>28e+1/8e3</i>	.	.	.	.	.	.	.	full NEWUOA [23]	
GLOBAL	2.9	3.6	<i>17e+1/800</i>	.	.	.	.	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	15	4.5	4.3	9	12	17	32	35	67	<i>14e-6/1e6</i>	iAMaLGaM IDEA [4]	
MA-LS-Chain	2	1.2	2.2	24	<i>27e-1/2e4</i>	.	.	.	.	.	MA-LS-Chain [19]	
MCS (Neum)	2.2	1.3	12	<i>36e+0/1e4</i>	.	.	.	.	.	.	MCS (Neum) [16]	
NEWUOA	41	<i>41e+1/5e3</i>	.	.	.	.	.	.	.	.	NEWUOA [23]	
(1+1)-ES	18	17	130	930	<i>67e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]	
PSO	68	46	57	96	<i>19e+0/1e5</i>	.	.	.	.	.	PSO [6]	
PSO_Bounds	2	43	120	93	<i>39e+0/1e5</i>	.	.	.	.	.	PSO_Bounds [7]	
Monte Carlo	1.7	7.7	240	<i>94e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	62	10	8.7	9.7	6.7	<i>26e+0/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]	
SNOBFIT	2	8.4	<i>21e+1/1e3</i>	.	.	.	.	.	.	.	SNOBFIT [17]	
VNS (Garcia)	100	14	21	270	4600	<i>60e-2/7e6</i>	.	.	.	.	VNS (Garcia) [10]	

Table 78: 05-D, running time excess ERT/ERT_{best} on f_{118} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

118 Ellipsoid Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	5.28	10.9	85.8	243	311	355	400	441	486	583	ERT_{best}/D
ALPS	10	34	13	32	940	4.1e4	<i>41e-3/1e6</i>	.	.	.	ALPS [15]
AMaLGaM IDEA	3.4	4.6	1	2.6	3.6	4.9	10	16	30	54	AMaLGaM IDEA [4]
avg NEWUOA	1.2	1	1.8	8.3	64	<i>18e-2/7e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	12	190	99	<i>90e+0/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	210	1800	<i>31e+1/3e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.2	7.8	3.2	2	1.9	2.1	2.1	2	2	1.8	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.8	5.7	8	22	230	<i>32e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	53	270	1300	<i>2.7e4</i>	<i>27e-1/9e5</i>	.	.	.	.	.	DASA [18]
DEPSO	10	18	17	38	97	<i>37e-1/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	5.6	65	110	320	910	4e3	<i>57e-2/1e5</i>	.	.	.	EDA-PSO [5]
full NEWUOA	1.3	1	1.3	5.9	70	<i>22e-2/9e3</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	9	7	1.8	3	<i>74e-2/700</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.8	3.4	2.7	3.1	7.7	11	22	44	60	130	iAMaLGaM IDEA [4]
MA-LS-Chain	5	12	4.1	14	44	86	130	260	370	640	MA-LS-Chain [19]
MCS (Neum)	10	24	140	<i>13e+0/1e4</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.3	4.3	10	120	<i>30e-2/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	3.7	13	36	530	<i>22e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	4.3	670	800	2700	<i>51e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	4.9	29	1800	<i>12e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	9	500	1.5e4	<i>10e+0/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	3.9	9.7	3.8	2	1.8	1.7	1.7	1.6	1.6	1.4	IPOP-SEP-CMA-ES [21]
SNOBFIT	3.2	23	87	<i>33e+0/1e3</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	8.4	8.3	1.8	1	1	1	1	1	1	1	VNS (Garcia) [10]

Table 79: 05-D, running time excess ERT/ERT_{best} on f_{119} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

119 Sum of different powers Gauss												
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$	
ERT_{best}/D	0.2	0.2	2.35	131	227	473	2070	6190	7060	9950	ERT_{best}/D	
ALPS	1	1.8	2.1	1.9	4.8	4.6	2	2.2	29	<i>15e-7/1e6</i>	ALPS [15]	
AMaLGaM IDEA	1	1.8	1.4	4.6	9.8	10	2.7	1	1	1	AMaLGaM IDEA [4]	
avg NEWUOA	1	3.4	19	23	<i>42e-2/6e3</i>	.	.	.	.	.	avg NEWUOA [23]	
BayEDAcG	1.1	1.3	2.2	2.5	4.6	4.2	7.1	<i>68e-4/2e3</i>	.	.	BayEDAcG [9]	
BFGS	1	45	220	120	<i>50e-1/2e3</i>	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	1	1.7	1.9	1	1	1	1	1	1.5	2.3	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	32	18	15	140	<i>20e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]	
DASA	1	41	210	750	1.5e4	<i>31e-2/7e5</i>	.	.	.	.	DASA [18]	
DEPSO	1	1.5	1.5	1	2.8	3.8	1.8	<i>19e-4/2e3</i>	.	.	DEPSO [11]	
EDA-PSO	1	1.4	1.4	1.9	8.6	8.5	2.8	15	210	<i>98e-6/1e5</i>	EDA-PSO [5]	
full NEWUOA	1	4.6	12	22	260	<i>31e-2/8e3</i>	.	.	.	.	full NEWUOA [23]	
GLOBAL	1	1.5	1	4.7	<i>80e-2/900</i>	.	.	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	1	1.3	1.3	2.8	9.1	19	6.7	3.8	3.8	3.6	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1.8	1.6	1.3	4	3.3	1.3	1.1	4.7	<i>61e-7/2e4</i>	MA-LS-Chain [19]	
MCS (Neum)	1	1	3.5	2	43	<i>75e-3/1e4</i>	.	.	.	.	MCS (Neum) [16]	
NEWUOA	1	1.7	26	35	<i>90e-2/5e3</i>	.	.	.	.	.	NEWUOA [23]	
(1+1)-ES	1	63	15	12	260	3900	<i>13e-3/1e6</i>	.	.	.	(1+1)-ES [1]	
PSO	1	1.3	1.8	71	120	60	18	36	<i>14e-5/1e5</i>	.	PSO [6]	
PSO_Bounds	1	1.2	1.7	56	73	44	17	35	97	<i>19e-5/1e5</i>	PSO_Bounds [7]	
Monte Carlo	1	1.5	1.4	12	6400	<i>10e-2/1e6</i>	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	5.4	4.5	11	8.5	5.9	2.5	1.5	1.7	2.8	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1.3	1.7	4.1	21	<i>51e-2/1e3</i>	.	.	.	.	SNOBFIT [17]	
VNS (Garcia)	1	1.2	2.8	8.2	7.4	10	4.6	7.9	130	1.2e4	VNS (Garcia) [10]	

Table 80: 05-D, running time excess ERT/ERT_{best} on f_{120} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	120 Sum of different powers unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.2	0.2	3.21	580	3740	6900	14500	35400	66700	1.1e5	ERT_{best}/D	
ALPS	1	1.3	1.5	1	2.8	53	1e3	<i>34e-4/1e6</i>	.	.	ALPS [15]	
AMaLGaM IDEA	1	1.4	1.5	13	16	35	66	130	<i>68e-5/1e6</i>	.	AMaLGaM IDEA [4]	
avg NEWUOA	1	42	94	49	<i>15e-1/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.6	1.2	49	<i>17e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	19	40	<i>37e-1/900</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	26	17	1.1	1	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	4.6	29	9.4	<i>45e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	40	840	260	<i>44e-2/7e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1.4	2.3	5	<i>10e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.3	1.1	14	23	64	<i>68e-3/1e5</i>	.	.	.	EDA-PSO [5]	
full NEWUOA	1	30	150	63	<i>22e-1/9e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.3	1	1.8	<i>90e-2/900</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.2	1.2	24	34	52	130	420	<i>13e-4/1e6</i>	.	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1.1	1	1.2	5.1	26	<i>34e-3/2e4</i>	.	.	.	MA-LS-Chain [19]	
MCS (Neum)	1	1	3.7	8.5	38	<i>48e-2/1e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	34	130	55	<i>24e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1.3	2.7	54	21	340	<i>91e-3/1e6</i>	.	.	.	.	(1+1)-ES [1]
PSO	1	1.8	2	120	44	200	100	<i>16e-2/1e5</i>	.	.	PSO [6]	
PSO_Bounds	1	1.7	1	88	77	<i>60e-2/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.8	1.1	2.3	550	<i>11e-2/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.2	48	11	5.9	21	<i>30e-2/1e4</i>	.	.	.	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1.5	1.2	3.3	<i>13e-1/1e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1.2	2	11	41	740	<i>58e-4/7e6</i>	.	.	.	VNS (Garcia) [10]	

Table 81: 05-D, running time excess ERT/ERT_{best} on f_{121} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

$\Delta ftarget$ ERT_{best}/D	121 Sum of different powers Cauchy										$\Delta ftarget$ ERT_{best}/D
	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	
ALPS	1.1	1.3	1	11	150	1.3e4	<i>97e-4/1e6</i>	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.5	2.1	1.8	12	25	26	34	42	99	AMaLGaM IDEA [4]
avg NEWUOA	1	3.3	4.3	3.3	45	790	<i>38e-3/6e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.7	3	23	25	18	29	<i>41e-4/2e3</i>	.	.	BayEDAcG [9]
BFGS	1	130	42	71	370	<i>50e-2/3e3</i>	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	4.3	2.7	1.1	1	1	1.1	1.7	2	2.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.6	9.8	59	<i>35e-3/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	13	180	3100	1.9e5	<i>34e-2/7e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1.1	4.6	2.9	5.9	62	<i>14e-3/2e3</i>	.	.	.	DEPSO [11]
EDA-PSO	1	1.7	2.2	9.9	2100	<i>98e-3/1e5</i>	.	.	.	.	EDA-PSO [5]
full NEWUOA	1.2	8	3.2	9.6	33	150	<i>13e-3/8e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	1	1.7	1.9	3.5	11	<i>10e-2/400</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.3	2.2	1.1	5.6	41	49	110	110	210	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.7	2.8	3.7	5.2	40	120	<i>99e-5/2e4</i>	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1.5	11	180	<i>88e-3/1e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	3.9	4.8	15	76	<i>86e-3/4e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	4.4	3	4.5	49	2200	<i>51e-4/1e6</i>	.	.	.	(1+1)-ES [1]
PSO	1	1.5	1.6	380	2300	<i>83e-3/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1.1	1.5	1.8	700	3800	1.4e4	<i>27e-2/1e5</i>	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.6	2.4	53	2e4	<i>87e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.5	2.3	1	1.1	1.3	1.1	1.2	1.2	1.1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.5	1.6	1.9	24	<i>11e-2/1e3</i>	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1.2	3.8	1.9	1.3	1.3	1	1	1	1	VNS (Garcia) [10]

Table 82: 05-D, running time excess ERT/ERT_{best} on f_{122} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

122 Schaffer F7 Gauss											
Δ ftarget	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δ ftarget
ERT_{best}/D	0.2	0.2	2.04	345	1840	4320	6020	8140	10700	22300	ERT_{best}/D
ALPS	1	1.1	2	2.9	2.8	4.9	20	47	640	<i>29e-6/1e6</i>	ALPS [15]
AMaLGaM IDEA	1	1.3	1.3	4.9	5.6	3.5	3.6	3.7	3.8	2.6	AMaLGaM IDEA [4]
avg NEWUOA	1	1.5	6.1	34	<i>11e-1/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.3	1.3	2.3	<i>30e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	12	87	<i>36e-1/3e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	2.2	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	21	58	<i>12e-1/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	3.7	410	3200	<i>10e-1/7e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1.1	3.4	2.9	<i>57e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.2	10	33	96	230	<i>37e-3/1e5</i>	.	.	EDA-PSO [5]
full NEWUOA	1	2.1	30	110	<i>17e-1/8e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.2	1.4	<i>18e-1/900</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.1	1.3	1.3	12	14	9	7.1	5.8	5.7	3.6	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1.6	4.3	4.8	6.8	61	<i>76e-4/2e4</i>	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	2.8	13	<i>54e-2/1e4</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.9	14	91	<i>18e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	3.1	17	72	<i>24e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1.1	1	48	120	330	<i>17e-2/1e5</i>	.	.	.	PSO [6]
PSO_Bounds	1	1.1	1.7	77	55	160	<i>85e-3/1e5</i>	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.1	2	100	<i>46e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	2	8.1	3.6	3.3	3.3	9	14	6.7	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	1.9	13	<i>20e-1/1e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	3.4	18	34	120	1800	<i>76e-5/8e6</i>	.	.	VNS (Garcia) [10]

Table 83: 05-D, running time excess ERT/ERT_{best} on f_{123} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

123 Schaffer F7 unif												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.2	0.2	2.24	3210	16300	45500	67100	90300	1.34e5	4.43e5	ERT_{best}/D	
ALPS	1	1.1	1.1	2.1	<i>25e-2/1e6</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.4	1.8	8.7	150	<i>15e-2/1e6</i>	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	2.5	80	<i>26e-1/6e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.1	2.7	<i>25e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1.4	46	<i>39e-1/900</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.5	8.1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	1	27	<i>21e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	60	420	3e3	<i>14e-1/7e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1.3	2.5	9.2	<i>26e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.2	1.7	33	<i>74e-2/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1.1	110	18	<i>35e-1/9e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.1	1.4	<i>20e-1/800</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	2.1	19	160	<i>18e-2/1e6</i>	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1.3	2.4	<i>64e-2/2e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	6.3	21	<i>16e-1/1e4</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.3	65	<i>37e-1/5e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1.2	22	23	<i>59e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1.7	48	87	<i>12e-1/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1.2	70	<i>18e-1/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.2	1	15	<i>49e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.1	6.1	5.5	<i>10e-1/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.2	3.5	<i>25e-1/1e3</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	3.1	28	3300	<i>16e-2/8e6</i>	.	.	.	.	VNS (Garcia) [10]

Table 84: 05-D, running time excess ERT/ERT_{best} on f_{124} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

$\Delta ftarget$ ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta ftarget$ ERT_{best}/D
	0.2	0.2	1.95	40.4	208	1790	4100	5280	9070	19000	
ALPS	1	1.1	1.4	14	<i>3.3e4</i>	<i>15e-2/1e6</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.3	2.1	25	15	10	10	16	19	17	AMaLGaM IDEA [4]
avg NEWUOA	1	2.1	6.1	89	<i>63e-2/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.1	1.8	8.7	6.9	3	<i>13e-3/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	1	2.2	73	990	<i>39e-1/3e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.5	1.5	1.1	1	1.2	1.1	1.1	1.2	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.1	4.7	33	<i>38e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	6.5	320	2e4	<i>97e-2/7e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1.1	2	10	<i>27e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.1	2	270	<i>56e-2/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1.3	5.3	45	<i>47e-2/8e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.2	1.7	21	<i>91e-2/800</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	1.1	15	40	18	17	48	57	35	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1.8	5.1	870	<i>20e-2/2e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	16	<i>55e-2/1e4</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.1	3	160	<i>11e-1/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1.4	4.7	35	3.5e4	<i>12e-2/1e6</i>	.	.	.	.	(1+1)-ES [1]
PSO	1	1.1	1.2	930	6800	<i>52e-2/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1.6	1400	<i>77e-2/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.1	1.9	960	<i>46e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.6	1.8	1	3.9	1	1	1	1	1.9	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.1	18	<i>88e-2/1e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	3.5	21	30	41	69	460	5400	<i>20e-6/7e6</i>	VNS (Garcia) [10]

Table 85: 05-D, running time excess ERT/ERT_{best} on f_{125} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

125 Griewank-Rosenbrock Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.2	0.2	0.2	0.2	0.2	25000	47700	48300	48600	49200	ERT_{best}/D
ALPS	1	1	1.3	35	1e4	3.5	140	290	290	<i>21e-4/1e6</i>	ALPS [15]
AMaLGaM IDEA	1	1	1.1	37	6800	3.2	13	20	23	22	AMaLGaM IDEA [4]
avg NEWUOA	1	1	2	81	1e4	<i>36e-3/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.2	42	3200	<i>65e-3/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	1	1	37	2400	<i>46e-2/3e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.1	17	3400	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	140	4.6e4	<i>75e-3/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	36	6500	1.2e6	<i>68e-3/7e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1	1	35	1.2e4	<i>98e-3/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.1	31	9200	7.7	<i>11e-3/1e5</i>	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	3.9	26	5600	4.8	<i>41e-3/8e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.3	35	1.3e4	<i>13e-2/900</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.2	24	6400	5.9	29	53	53	52	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.3	35	4700	1.2	<i>80e-4/2e4</i>	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	1.7	<i>15e-3/1e4</i>	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	3.9	15	6100	2.8	<i>40e-3/5e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	2.5	210	3.3e4	180	<i>13e-3/1e6</i>	.	.	.	(1+1)-ES [1]
PSO	1	1	1.2	50	7e4	28	30	<i>29e-3/1e5</i>	.	.	PSO [6]
PSO_Bounds	1	1	1.2	27	2.2e4	7.9	<i>14e-3/1e5</i>	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1.1	60	1.5e5	<i>36e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	22	1.2e4	5.8	<i>28e-3/1e4</i>	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.3	30	1.1e4	<i>13e-2/1e3</i>	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	52	2.6e4	27	250	1200	2500	<i>87e-5/8e6</i>	VNS (Garcia) [10]

Table 86: 05-D, running time excess ERT/ERT_{best} on f_{126} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

126 Griewank-Rosenbrock unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.2	0.2	0.2	0.2	0.2	1.75e5	nan	nan	nan	nan	ERT_{best}/D
ALPS	1	1	1.2	30	4.2e4	<i>21e-3/1e6</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1	45	3e4	84	15e-3/1e6	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1	22	1600	4.5e5	<i>26e-2/6e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.2	29	<i>27e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	5.4	460	<i>49e-2/1e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	160	1.3e4	2.1	<i>67e-4/9e5</i>	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	410	1.6e5	<i>12e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	2.9	3300	2.4e6	<i>70e-3/7e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1	1.1	51	1.4e5	<i>21e-2/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1	34	4.7e4	<i>35e-3/1e5</i>	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	2.6	1700	<i>25e-2/9e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1	42	6.2e4	<i>23e-2/800</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1	38	6.9e4	42	<i>16e-3/1e6</i>	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	35	9400	1	<i>27e-3/2e4</i>	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	<i>25e-3/1e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	1.2	1100	3.5e5	<i>26e-2/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	18	430	2.4e5	<i>27e-3/1e6</i>	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1.2	40	2.1e5	<i>63e-3/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1.3	26	3.6e5	<i>84e-3/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1.1	43	1.2e5	82	<i>34e-3/1e6</i>	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	110	4e4	<i>85e-3/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.3	90	<i>19e-2/1e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	56	1.2e5	680	<i>15e-3/8e6</i>	.	.	.	VNS (Garcia) [10]

Table 87: 05-D, running time excess ERT/ERT_{best} on f_{127} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	127 Griewank-Rosenbrock Cauchy											
	$\Delta ftarget$ ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta ftarget$ ERT_{best}/D
ALPS	1	1	1.4	46	2.5e4	<i>17e-3/1e6</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1.1	40	2700	2.2	5.1	10	14	26	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1	2	18	5200	<i>53e-3/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.3	35	2200	<i>41e-3/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	7.8	1300	<i>38e-2/3e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	19	2100	1.2	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1.3	51	5.5e4	<i>92e-3/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	61	4400	2.8e6	<i>86e-3/7e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1	1.3	36	1.5e4	<i>96e-3/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.3	32	6.3e4	<i>49e-3/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	4.1	25	1.1e4	<i>59e-3/8e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	37	<i>24e-2/800</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.3	24	9800	3.9	17	41	40	180	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.2	39	8600	7	<i>32e-3/2e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	<i>25e-3/1e4</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	2.5	14	7200	<i>62e-3/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	1.1	65	3.6e4	550	<i>24e-3/1e6</i>	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1	40	1.5e5	<i>75e-3/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1.2	44	1.3e5	<i>78e-3/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1	47	1.2e5	540	<i>33e-3/1e6</i>	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	19	3700	1	2.2	<i>18e-3/1e4</i>	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.3	24	2.2e4	<i>20e-2/1e3</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	52	2.7e4	14	120	210	210	210	210	VNS (Garcia) [10]

Table 88: 05-D, running time excess ERT/ERT_{best} on f_{128} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

128 Gallagher Gauss											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
	0.2	0.2	22.2	850	1560	2100	2490	2980	3440	4230	
ALPS	1	1	1.7	1	1	1	1	1	1	1	ALPS [15]
AMaLGaM IDEA	1	1	1.2	46	46	35	30	25	22	18	AMaLGaM IDEA [4]
avg NEWUOA	1	1	11	9.3	7.5	42	<i>31e-2/6e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.3	2.8	19	<i>60e-2/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	1	1	88	<i>94e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	2.2	6.9	10	7.8	6.6	5.5	4.8	3.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	9.1	4.6	6.8	11	17	14	19	<i>28e-3/1e4</i>	(1+1)-CMA-ES [2]
DASA	1	1	230	180	400	2400	4200	<i>65e-3/7e5</i>	.	.	DASA [18]
DEPSO	1	1	2.8	4.4	3.9	2.9	2.5	2.1	1.8	1.5	DEPSO [11]
EDA-PSO	1	1	1.4	33	44	33	28	24	21	17	EDA-PSO [5]
full NEWUOA	1	1	15	11	36	57	<i>16e-2/8e3</i>	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1	1.6	2.3	1.7	4.8	<i>17e-1/900</i>	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	8.2	34	21	16	15	12	11	8.9	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	1.3	1.3	1.5	1.6	1.5	1.4	1.3	MA-LS-Chain [19]
MCS (Neum)	1	1	4.6	2.3	3.6	9.5	59	<i>49e-3/1e4</i>	.	.	MCS (Neum) [16]
NEWUOA	1	1	12	17	43	<i>19e-1/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	7.5	5.8	8.4	10	26	75	140	1e3	(1+1)-ES [1]
PSO	1	1	1.9	50	73	55	46	39	34	27	PSO [6]
PSO_Bounds	1	1	2.2	100	130	130	110	93	81	66	PSO_Bounds [7]
Monte Carlo	1	1	1.8	4.1	41	710	6e3	<i>10e-3/1e6</i>	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	6.8	13	7.6	5.7	4.8	4	3.5	2.8	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	2.4	3.3	4.7	7.1	6	<i>18e-1/1e3</i>	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	13	12	8.7	7.4	6.2	5.5	5	VNS (Garcia) [10]

Table 89: 05-D, running time excess ERT/ERT_{best} on f_{129} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

129 Gallagher unif											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
	0.2	0.2	12.8	2140	11900	46300	56900	72900	1.02e5	1.16e5	
ALPS	1	1	3.3	2.7	1.7	1	1	1	1	1	ALPS [15]
AMaLGaM IDEA	1	1	2.7	19	12	4.2	4.8	4.5	3.3	4.2	AMaLGaM IDEA [4]
avg NEWUOA	1	1	68	20	<i>30e-1/6e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	27	<i>62e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	85	<i>76e-1/900</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	12	7.1	9.2	4.8	3.9	3	2.2	1.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	34	5.7	5.9	<i>77e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	230	140	400	<i>25e-2/7e5</i>	.	.	.	.	DASA [18]
DEPSO	1	1	5.7	14	<i>24e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	5.3	36	11	9	12	9.2	6.7	12	EDA-PSO [5]
full NEWUOA	1	1	130	58	<i>55e-1/9e3</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.5	1.7	1	<i>21e-1/900</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	25	25	13	4.3	4.7	4.4	5.8	8.6	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.5	1	1.6	1.7	6.5	5	3.6	<i>16e-3/2e4</i>	MA-LS-Chain [19]
MCS (Neum)	1	1	9.9	4.9	2.8	<i>64e-2/1e4</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	120	16	<i>61e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	29	6.8	9	23	<i>60e-4/1e6</i>	.	.	.	(1+1)-ES [1]
PSO	1	1	1	130	34	15	<i>20e-1/1e5</i>	.	.	.	PSO [6]
PSO_Bounds	1	1	2.8	130	34	<i>20e-1/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	2.8	1.3	5.7	36	260	<i>13e-3/1e6</i>	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	42	9.2	3.8	<i>18e-1/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	5.3	<i>29e-1/1e3</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	2.2	16	8.9	7	8.9	16	26	240	VNS (Garcia) [10]

Table 90: 05-D, running time excess ERT/ERT_{best} on f_{130} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

130 Gallagher Cauchy												
$\Delta\text{ftarget}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta\text{ftarget}$	
ERT_{best}/D	0.2	0.2	10.9	162	607	1640	6560	6750	6780	6910	ERT_{best}/D	
ALPS	1	1	1.4	7.7	4.5	4.8	19	220	2100	<i>12e-5/1e6</i>	ALPS [15]	
AMaLGaM IDEA	1	1	2.1	160	140	52	13	13	14	15	AMaLGaM IDEA [4]	
avg NEWUOA	1	1	1.3	6.4	5.9	6	3	13	<i>14e-3/6e3</i>	.	avg NEWUOA [23]	
BayEDAcG	1	1	2.5	170	47	<i>19e-1/2e3</i>	.	.	.	.	BayEDAcG [9]	
BFGS	1	1	34	110	<i>20e-1/3e3</i>	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	1	1	1.9	57	55	20	5.1	5	5	5	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	1	2.7	6.8	4.6	6	6.8	<i>71e-4/1e4</i>	.	.	(1+1)-CMA-ES [2]	
DASA	1	1	150	550	1500	<i>60e-3/7e5</i>	.	.	.	.	DASA [18]	
DEPSO	1	1	4.6	12	5.7	3.1	1	4.4	4.4	<i>94e-2/2e3</i>	DEPSO [11]	
EDA-PSO	1	1	5	310	110	130	110	<i>23e-3/1e5</i>	.	.	EDA-PSO [5]	
full NEWUOA	1	1	3	7	3	3	2.4	17	<i>14e-4/8e3</i>	.	full NEWUOA [23]	
GLOBAL	1	1	2.5	1	1	1	1.1	<i>33e-3/500</i>	.	.	GLOBAL [20]	
iAMaLGaM IDEA	1	1	1.5	130	55	23	6.4	7	7.5	7.5	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1	2.4	27	17	8.2	2.1	2.3	2.5	2.9	MA-LS-Chain [19]	
MCS (Neum)	1	1	4.1	21	29	40	<i>35e-2/1e4</i>	.	.	.	MCS (Neum) [16]	
NEWUOA	1	1	2.3	11	10	19	<i>62e-3/4e3</i>	.	.	.	NEWUOA [23]	
(1+1)-ES	1	1	3.3	5.8	3.1	6.6	7	76	380	<i>57e-6/1e6</i>	(1+1)-ES [1]	
PSO	1	1	1.7	380	330	250	110	220	<i>78e-2/1e5</i>	.	PSO [6]	
PSO_Bounds	1	1	3.1	570	480	<i>84e-2/1e5</i>	.	.	.	.	PSO_Bounds [7]	
Monte Carlo	1	1	3.2	31	110	530	2300	<i>42e-4/1e6</i>	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	1	1	27	11	4.1	1	1	1	1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1	1.5	3.8	5.3	9.1	2.3	<i>39e-2/1e3</i>	.	.	SNOBFIT [17]	
VNS (Garcia)	1	1	1.8	120	110	70	18	18	18	17	VNS (Garcia) [10]	

Table 91: 10-D, running time excess ERT/ERT_{best} on f_{101} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

101 Sphere moderate Gauss												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.1	0.1	2.6	4	18	18.5	19.4	20	21	22.6	ERT_{best}/D	
ALPS	1	4.5	70	130	51	72	89	110	120	160	ALPS [15]	
AMaLgAM IDEA	1	6.4	17	30	11	15	19	22	24	28	AMaLgAM IDEA [4]	
avg NEWUOA	1	20	2.9	3.4	1	1.2	1.2	1.3	1.3	1.4	avg NEWUOA [23]	
BayEDAcG	1	7.1	53	81	45	86	110	130	130	140	BayEDAcG [9]	
BFGS	1	840	<i>36e+0/3e3</i>	.	.	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	1	13	5.4	7.8	2.5	3.3	4	4.6	5.1	6.1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	6.9	3	4.2	1.4	1.8	2.2	2.6	2.9	3.5	(1+1)-CMA-ES [2]	
DASA	1	180	30	34	10	13	14	16	18	21	DASA [18]	
DEPSO	1	5.8	16	27	11	16	21	26	31	41	DEPSO [11]	
EDA-PSO	1	6.1	25	380	180	280	360	440	510	640	EDA-PSO [5]	
full NEWUOA	1	45	4	4.1	1	1	1	1	1	1	full NEWUOA [23]	
GLOBAL	1	3.9	13	11	3	3.3	3.7	3.9	4.1	5	GLOBAL [20]	
iAMaLgAM IDEA	1	5.7	8.1	13	5.1	6.9	8.3	9.9	11	14	iAMaLgAM IDEA [4]	
MA-LS-Chain	1	5.5	11	19	8.3	11	13	15	16	18	MA-LS-Chain [19]	
MCS (Neum)	1	1	1	1	20	870	<i>28e-3/4e3</i>	.	.	.	MCS (Neum) [16]	
NEWUOA	1	15	2.1	3	1.1	1.6	1.9	2.1	2.3	2.9	NEWUOA [23]	
(1+1)-ES	1	15	3.1	3.7	1.2	1.5	1.8	2.2	2.4	2.9	(1+1)-ES [1]	
PSO	1	5.3	8.9	25	12	18	25	31	35	45	PSO [6]	
PSO_Bounds	1	5.5	13	140	96	150	220	250	280	480	PSO_Bounds [7]	
Monte Carlo	1	3.1	2200	<i>36e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	11	5.1	6.5	2.2	2.8	3.3	3.9	4.3	5.1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	10	4.6	3.9	1	1.1	1.3	1.4	1.6	1.9	SNOBFIT [17]	
VNS (Garcia)	1	12	12	11	3.3	4	4.5	5.3	5.7	6.7	VNS (Garcia) [10]	

Table 92: 10-D, running time excess ERT/ERT_{best} on f_{102} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

102 Sphere moderate unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.1	0.1	2.57	4.08	17.6	20.8	22.6	23.9	26.5	30.4	ERT_{best}/D
ALPS	1	3.7	69	130	52	64	78	91	100	120	ALPS [15]
AMaLGaM IDEA	1	6.8	17	30	11	13	15	17	17	20	AMaLGaM IDEA [4]
avg NEWUOA	1	31	2.9	3.2	1	1.1	1.2	1.3	1.4	1.7	avg NEWUOA [23]
BayEDAcG	1	5.8	51	73	27	37	41	52	61	63	BayEDAcG [9]
BFGS	1	640	<i>34e+0/3e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	8.5	4.9	7.1	2.6	2.9	3.2	3.8	4	4.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	11	3.1	4	1.3	1.6	1.9	2.2	2.3	2.6	(1+1)-CMA-ES [2]
DASA	1	190	31	34	12	13	15	17	18	22	DASA [18]
DEPSO	1	5.7	18	26	11	14	18	22	24	29	DEPSO [11]
EDA-PSO	1	4.8	45	390	200	250	310	370	400	470	EDA-PSO [5]
full NEWUOA	1	40	4.3	4.2	1.1	1	1	1	1	1	full NEWUOA [23]
GLOBAL	1	4.9	13	10	3.3	3.8	4.3	4.9	7.2	26	GLOBAL [20]
iAMaLGaM IDEA	1	4.4	7.2	13	5.1	6.1	7.3	8.3	8.9	10	iAMaLGaM IDEA [4]
MA-LS-Chain	1	5.1	11	21	9.2	11	12	13	13	14	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	460	<i>13e-2/4e3</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	18	3.5	7.9	9	30	48	81	150	550	NEWUOA [23]
(1+1)-ES	1	15	3	4	1.3	1.5	1.7	2.1	2.7	4.5	(1+1)-ES [1]
PSO	1	4.7	9.1	1800	420	360	340	320	300	270	PSO [6]
PSO_Bounds	1	7.1	13	98	99	140	190	210	220	440	PSO_Bounds [7]
Monte Carlo	1	6.2	3100	<i>33e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	9	4.1	6.1	2.1	2.3	2.7	3	3.2	3.6	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	6.3	6.1	7.6	2	2.1	2.1	2.6	3.6	5.3	SNOBFIT [17]
VNS (Garcia)	1	12	12	11	3.4	3.7	4.1	4.5	4.6	5	VNS (Garcia) [10]

Table 93: 10-D, running time excess ERT/ERT_{best} on f_{103} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	103 Sphere moderate Cauchy										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.1	0.1	2.62	4.7	12.6	14.1	36	36.3	36.3	36.4	ERT_{best}/D
ALPS	1	4.9	67	110	75	96	<i>2.5e4</i>	<i>10e-4/5e5</i>	.	.	ALPS [15]
AMaLGaM IDEA	1	4.4	17	27	16	19	30	100	230	380	AMaLGaM IDEA [4]
avg NEWUOA	1	31	3	2.9	1.8	6.8	25	100	1500	<i>39e-6/8e3</i>	avg NEWUOA [23]
BayEDAcG	1	5.6	44	66	62	80	49	53	58	67	BayEDAcG [9]
BFGS	1	230	12	6.5	2.9	2.5	1	1	1	1	BFGS [22]
BIPOP-CMA-ES	1	9.3	5.5	6.1	3.6	4.2	2.2	2.6	3.1	4.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	9.7	3.4	3.6	2.5	6	23	92	710	<i>18e-6/1e4</i>	(1+1)-CMA-ES [2]
DASA	1	57	21	22	39	1100	<i>2.4e5</i>	<i>16e-4/6e5</i>	.	.	DASA [18]
DEPSO	1	14	17	21	17	72	150	<i>25e-4/2e3</i>	.	.	DEPSO [11]
EDA-PSO	1	4.6	37	350	280	1500	<i>71e-4/1e5</i>	.	.	.	EDA-PSO [5]
full NEWUOA	1	45	3.8	3.4	1.4	1.9	1.4	2.8	7.5	20	full NEWUOA [23]
GLOBAL	1	6.3	25	17	7.1	6.9	2.7	2.7	2.7	2.7	GLOBAL [20]
iAMaLGaM IDEA	1	4.4	7.5	12	7.4	9.3	7.4	39	200	1e3	iAMaLGaM IDEA [4]
MA-LS-Chain	1	7.3	10	18	12	15	8.6	11	17	30	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	14	14	13	25	50	170	MCS (Neum) [16]
NEWUOA	1	15	2.3	3.6	5.2	29	95	240	1100	<i>15e-5/6e3</i>	NEWUOA [23]
(1+1)-ES	1	12	3.4	3.6	1.9	7.8	46	600	7800	4.1e5	(1+1)-ES [1]
PSO	1	5.5	9.1	1500	580	2300	<i>1.9e4</i>	<i>56e-4/1e5</i>	.	.	PSO [6]
PSO_Bounds	1	3.4	11	110	1500	4.6e4	<i>40e-3/1e5</i>	.	.	.	PSO_Bounds [7]
Monte Carlo	1	5.3	1600	<i>36e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	10	4.8	5.6	3	3.6	1.9	2.3	2.7	3.5	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	3.8	3.9	2.5	1	1	1.4	2.7	5.5	7.7	SNOBFIT [17]
VNS (Garcia)	1	12	11	9.4	4.7	5.3	2.6	3.1	3.8	5	VNS (Garcia) [10]

Table 94: 10-D, running time excess ERT/ERT_{best} on f_{104} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

104 Rosenbrock moderate Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	4.81	23.4	45.3	999	1660	1840	1940	2020	2080	2200	ERT_{best}/D
ALPS	49	26	32	14	14	16	21	33	51	110	ALPS [15]
AMaLGaM IDEA	10	4.2	5.8	1.4	1	1	1	1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	1	1	1	7.1	22	<i>67e-2/8e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	24	13	47	<i>97e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>12e+3/1e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	3.5	3	3.6	1.8	1.3	1.3	1.3	1.2	1.2	1.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.2	2.1	2.8	5.5	19	80	<i>46e-2/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	17	11	15	2.1	7.2	23	78	180	1900	<i>28e-6/9e5</i>	DASA [18]
DEPSO	11	5.8	11	30	<i>70e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	72	74	97	18	17	22	28	34	40	<i>67e-8/1e5</i>	EDA-PSO [5]
full NEWUOA	2	1.6	1.6	1.6	2.6	2.5	6.4	6.1	11	14	full NEWUOA [23]
GLOBAL	6.9	1.9	1.8	1	1.4	2.8	<i>39e-1/300</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	5.7	2.6	2.9	2.5	1.6	1.5	1.5	1.5	1.5	1.4	iAMaLGaM IDEA [4]
MA-LS-Chain	7.5	3.9	5.7	34	21	20	19	18	18	17	MA-LS-Chain [19]
MCS (Neum)	3.8	36	<i>61e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	2.1	7.2	4.6	47	<i>55e-2/5e3</i>	.	.	.	.	NEWUOA [23]
(1+1)-ES	2.5	2	1.8	5.2	9.9	32	66	390	1200	<i>21e-6/1e6</i>	(1+1)-ES [1]
PSO	7.8	5.8	9.4	400	430	<i>59e-1/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	21	26	71	660	400	770	730	700	<i>63e-1/1e5</i>	.	PSO_Bounds [7]
Monte Carlo	6700	<i>26e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	3.1	1.3	1.3	5.7	3.6	3.3	3.2	3	3	2.8	IPOP-SEP-CMA-ES [21]
SNOBFIT	6.1	5.4	18	7.3	<i>13e+0/500</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	7.9	3.3	22	54	51	46	45	44	42	40	VNS (Garcia) [10]

Table 95: 10-D, running time excess ERT/ERT_{best} on f_{105} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

105 Rosenbrock moderate unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	3.11	32.8	95	2150	7010	7260	7420	7730	7820	7970	ERT_{best}/D
ALPS	74	17	16	10	5.3	6.9	12	14	19	42	ALPS [15]
AMaLGaM IDEA	13	2.6	2.3	3.9	1.2	1.2	1.2	1.2	1.2	1.2	AMaLGaM IDEA [4]
avg NEWUOA	1.9	1.7	2.5	5.1	3.7	16	<i>88e-2/8e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	42	8.8	18	<i>83e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>20e+3/1e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.8	1.1	1	2.9	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.7	2.4	1.8	4.5	4.4	20	<i>55e-2/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	33	11	18	3.1	2.6	17	54	250	1400	<i>24e-5/8e5</i>	DASA [18]
DEPSO	18	3.5	3.4	<i>76e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	120	54	45	<i>52e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	2.9	1.3	1.2	4.4	6.4	<i>32e-2/1e4</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	11	1.5	1.6	1	<i>70e-1/300</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	9	1.8	1.2	9.5	3	2.9	2.9	2.8	2.8	2.8	iAMaLGaM IDEA [4]
MA-LS-Chain	12	3	5.2	160	<i>52e-1/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	7	25	<i>70e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.2	11	10	<i>52e-1/5e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	3.6	1	1.7	8.7	10	45	170	300	1800	<i>71e-5/1e6</i>	(1+1)-ES [1]
PSO	15	220	80	300	<i>65e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	27	16	98	320	200	<i>75e-1/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	7500	<i>32e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	5.4	1.4	1	32	20	<i>72e-1/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	14	4.6	11	<i>16e+0/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	11	29	18	310	300	650	730	800	1200	4900	VNS (Garcia) [10]

Table 96: 10-D, running time excess ERT/ERT_{best} on f_{106} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

106 Rosenbrock moderate Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	3.44	12.8	28.8	342	771	819	850	874	897	937	ERT_{best}/D
ALPS	72	47	47	140	140	1500	<i>12e-3/5e5</i>	.	.	.	ALPS [15]
AMaLGaM IDEA	13	7.6	8.6	35	45	86	210	340	430	620	AMaLGaM IDEA [4]
avg NEWUOA	1.5	1	1.3	5.4	19	160	<i>13e-2/9e3</i>	.	.	.	avg NEWUOA [23]
BayEDAcG	36	25	100	<i>11e+0/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	71	210	<i>44e+0/4e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	5.3	3.8	2.9	1.7	1	1.1	1.2	1.2	1.2	1.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.5	3.1	3.5	24	40	170	<i>51e-2/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	21	13	11	6.6	29	4e3	<i>16e-3/1e6</i>	.	.	.	DASA [18]
DEPSO	16	10	17	85	<i>67e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	140	140	160	<i>43e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	2.6	1.5	1	1	8.1	89	<i>48e-3/1e4</i>	.	.	.	full NEWUOA [23]
GLOBAL	9.8	3.3	2.6	5.4	<i>42e-1/300</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	7.1	4.5	4.4	21	17	46	90	210	340	810	iAMaLGaM IDEA [4]
MA-LS-Chain	11	7.3	8.3	5.7	4.9	6.5	8.2	11	14	32	MA-LS-Chain [19]
MCS (Neum)	5.3	24	<i>61e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.3	1.6	7.5	14	26	<i>11e-2/7e3</i>	.	.	.	NEWUOA [23]
(1+1)-ES	2.7	2.3	2.4	18	61	370	1.7e4	<i>57e-4/1e6</i>	.	.	(1+1)-ES [1]
PSO	9.8	11	13	1900	1800	<i>62e-1/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	27	37	320	<i>65e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1e4	<i>32e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	4.8	2.3	2.1	2	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	8.8	9.3	14	<i>70e-1/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	11	5.3	4.6	11	4.8	4.6	4.5	4.4	4.3	4.2	VNS (Garcia) [10]

Table 97: 10-D, running time excess ERT/ERT_{best} on f_{107} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

$\Delta\text{ftarget}$ ERT_{best}/D	107 Sphere Gauss										$\Delta\text{ftarget}$ ERT_{best}/D
	1e+03 0.1	1e+02 0.1	1e+01 94.5	1e+00 225	1e-01 387	1e-02 521	1e-03 735	1e-04 960	1e-05 1130	1e-07 1430	
ALPS	1	5.1	3.2	6	8	11	14	19	26	86	ALPS [15]
AMaLGaM IDEA	1	3.5	5.8	13	15	14	12	10	9.7	9.4	AMaLGaM IDEA [4]
avg NEWUOA	1	32	230	<i>15e+0/7e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	4.2	3	4	4.5	29	<i>32e-3/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	1	600	<i>33e+0/1e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	17	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	180	230	<i>11e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	3e3	1.1e4	<i>11e+0/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	4.1	2.7	13	<i>97e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	3.5	9.2	44	30	37	40	32	28	24	EDA-PSO [5]
full NEWUOA	1	130	230	<i>13e+0/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	5.1	77	<i>17e+0/500</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	7	3.9	26	42	53	45	35	30	27	iAMaLGaM IDEA [4]
MA-LS-Chain	1	6.1	2.2	6.1	6.9	7.8	7.7	6.9	6.3	5.8	MA-LS-Chain [19]
MCS (Neum)	1	1	28	<i>87e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	15	130	<i>23e+0/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	200	240	6.3e4	<i>19e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	4.9	460	260	270	240	260	210	310	1e3	PSO [6]
PSO_Bounds	1	4.4	84	240	560	1300	<i>59e-2/1e5</i>	.	.	.	PSO_Bounds [7]
Monte Carlo	1	4.2	38	<i>30e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	17	12	16	16	14	12	9.5	8.2	13	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	7.9	11	<i>13e+0/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	12	28	27	36	42	65	110	200	960	VNS (Garcia) [10]

Table 98: 10-D, running time excess ERT/ERT_{best} on f_{108} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

108 Sphere unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.1	0.1	1e3	3140	4760	7750	10900	13600	17900	30800	ERT_{best}/D
ALPS	1	2.6	1.2	460	<i>12e-1/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	5.2	19	33	77	85	320	<i>28e-4/1e6</i>	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1400	<i>27e+0/7e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	5.7	<i>21e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	240	<i>40e+0/800</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	180	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	380	30	<i>13e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	4600	640	<i>10e+0/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	28	29	<i>18e+0/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	4.4	94	450	<i>99e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	3300	140	<i>29e+0/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	3.9	<i>19e+0/500</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	5.9	18	61	97	160	1300	1100	<i>62e-4/1e6</i>	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	5.5	1.1	240	<i>24e-1/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	27	<i>18e+0/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	590	<i>28e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	270	95	<i>54e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	2.7	190	<i>17e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	4.7	120	<i>11e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	6	4.1	<i>34e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	47	45	<i>15e+0/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	5.1	<i>21e+0/500</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	12	48	4300	<i>13e-1/5e6</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 99: 10-D, running time excess ERT/ERT_{best} on f_{109} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

109 Sphere Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.1	0.1	2.79	28.6	49.9	82.4	116	146	179	242	ERT_{best}/D
ALPS	1	2.3	68	57	1.4e5	<i>20e-2/5e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	4.9	16	4.1	12	43	53	58	91	160	AMaLGaM IDEA [4]
avg NEWUOA	1	20	11	38	670	<i>31e-2/7e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	2.9	43	11	11	17	21	19	17	<i>35e-7/2e3</i>	BayEDAcG [9]
BFGS	1	440	270	49	28	17	12	9.7	9.9	7.3	BFGS [22]
BIPOP-CMA-ES	1	13	4.7	1.1	1.1	1.1	1.1	1.1	1.2	1.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	13	8.9	53	1400	<i>30e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	150	1600	<i>26e-1/5e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	6.1	17	7.5	46	<i>87e-3/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1	4.1	39	1.1e4	<i>13e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	33	27	24	2900	<i>34e-2/1e4</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1	7.3	13	6.3	<i>35e-2/300</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	5.1	8.3	2.1	10	54	130	190	270	450	iAMaLGaM IDEA [4]
MA-LS-Chain	1	5.3	10	4.5	9.5	180	3200	<i>28e-4/5e4</i>	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	19	73	200	230	180	320	240	MCS (Neum) [16]
NEWUOA	1	16	12	77	<i>57e-2/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	12	5.9	7.7	1900	<i>42e-3/1e6</i>	.	.	.	.	(1+1)-ES [1]
PSO	1	5.1	160	4100	<i>10e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	5	2600	<i>31e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	5.9	2400	<i>29e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	9	4.8	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	4.8	6.5	18	140	<i>85e-2/500</i>	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	12	11	1.6	1.5	1.4	1.3	1.3	1.3	1.3	VNS (Garcia) [10]

Table 100: 10-D, running time excess ERT/ERT_{best} on f_{110} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

110 Rosenbrock Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	35.2	141	1120	3.32e6	7.03e6	1.64e7	nan	nan	nan	nan	ERT_{best}/D
ALPS	8.2	6.1	15	1	1	<i>27e-1/5e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1.6	1.1	6.5	<i>70e-1/1e6</i>	.	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	620	<i>16e+2/7e3</i>	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	4.8	3.9	4.3	<i>11e+0/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>19e+3/700</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.3	1	1	4.9	2.3	1	<i>56e-1/1e6</i>	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	220	<i>69e+1/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1.3e4	<i>79e+1/4e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	2.8	5.7	<i>28e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	15	12	83	<i>87e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1300	<i>27e+2/1e4</i>	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	<i>41e+2/400</i>	.	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	4.3	20	<i>61e-1/1e6</i>	.	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	3.2	3	7.4	<i>75e-1/5e4</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	29	<i>45e+1/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	100	<i>83e+1/4e3</i>	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	570	<i>14e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	3	17	610	<i>14e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	210	370	370	<i>27e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1600	<i>26e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.1	7.6	13	<i>95e-1/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	12	<i>43e+1/500</i>	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1.9	26	39	3.6	<i>16e-1/6e6</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 101: 10-D, running time excess ERT/ERT_{best} on f_{111} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	111 Rosenbrock unif										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	384	1950	8290	nan	nan	nan	nan	nan	nan	nan	ERT_{best}/D
ALPS	1.8	3.8	<i>21e+0/5e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	6	3.7	16	<i>80e-1/1e6</i>	.	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	260	<i>10e+3/7e3</i>	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.5	15	<i>39e+1/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>14e+3/500</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.1	1	1	<i>70e-1/1e6</i>	.	.	.	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>25e+2/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>19e+2/4e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	24	<i>21e+2/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	45	120	<i>17e+1/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	<i>94e+2/1e4</i>	.	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	<i>56e+2/400</i>	.	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	4.6	11	35	<i>86e-1/1e6</i>	.	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	5.6	<i>42e+0/5e4</i>	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	33	<i>20e+2/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	<i>74e+2/4e3</i>	.	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	340	<i>54e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	250	730	<i>76e+1/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	180	<i>85e+1/1e5</i>	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	59	<i>30e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	13	9.2	<i>11e+1/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	<i>28e+2/500</i>	.	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	34	130	<i>23e+0/6e6</i>	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 102: 10-D, running time excess ERT/ERT_{best} on f_{112} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

112 Rosenbrock Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	3.71	14.9	88.4	1160	1610	1740	1820	1890	1950	2040	ERT_{best}/D
ALPS	56	37	30	1500	<i>17e-1/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	11	5.9	6.6	300	250	240	230	230	220	210	AMaLGaM IDEA [4]
avg NEWUOA	1.5	2.2	10	98	71	<i>42e-1/8e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	31	20	23	<i>85e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	2900	<i>24e+2/2e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.6	5	1.2	1	1	1.1	1.1	1.1	1.1	1.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.6	4.5	8.1	<i>48e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	23	61	320	<i>31e-1/6e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	15	8.4	15	<i>88e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	120	120	300	<i>93e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	2.7	3	4.6	<i>32e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	8.9	3.7	2.5	<i>78e-1/300</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	6.4	4.1	2.2	390	340	320	310	330	320	310	iAMaLGaM IDEA [4]
MA-LS-Chain	9.7	6.1	2.9	280	<i>56e-1/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	4.3	37	<i>66e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	27	<i>81e-1/5e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	3.7	2.7	7.4	760	<i>70e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	11	530	1400	<i>10e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	31	51	1.6e4	<i>16e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	8100	<i>33e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	4.4	2.6	1	1.2	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	7.8	8.9	40	<i>21e+0/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	10	4.3	1.2	4.9	3.7	3.6	3.4	3.3	3.3	3.2	VNS (Garcia) [10]

Table 103: 10-D, running time excess ERT/ERT_{best} on f_{113} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

Δf_{target} ERT_{best}/D	113 Step-ellipsoid Gauss										Δf_{target} ERT_{best}/D
	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	
ALPS	2.6	3.3	2.4	5.9	7.3	43	72	72	72	83	ALPS [15]
AMaLGaM IDEA	1.7	1	1.8	2.9	1.2	1.4	1.6	1.6	1.6	1.6	AMaLGaM IDEA [4]
avg NEWUOA	4.9	59	<i>40e+0/7e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.9	3	2.3	<i>40e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	110	360	<i>14e+1/1e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	5.8	55	320	<i>32e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	760	560	1.4e4	<i>25e+0/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1.7	3.1	6.3	<i>10e+0/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	2.6	24	58	73	<i>21e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	9.8	100	<i>50e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1.9	3.5	<i>34e+0/600</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.8	1.1	3.1	4.7	3.4	4.1	4.1	4.1	4.1	3.9	iAMaLGaM IDEA [4]
MA-LS-Chain	1.9	2	2.2	7	16	67	67	67	67	65	MA-LS-Chain [19]
MCS (Neum)	1	12	130	<i>23e+0/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	32	47	<i>39e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	22	37	1200	<i>87e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1.8	2.8	150	510	<i>70e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1.8	2.1	1500	<i>23e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	2.5	3.4	4200	<i>10e+0/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	3.2	16	7.4	17	<i>23e-1/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.2	4.2	<i>29e+0/500</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1.4	2.3	14	64	360	7100	7100	7100	7100	6900	VNS (Garcia) [10]

Table 104: 10-D, running time excess ERT/ERT_{best} on f_{114} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	114 Step-ellipsoid unif							1e-07	Δf_{target} ERT_{best}/D
	0.1	30.7	3660	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	40600	ERT_{best}/D	
ALPS	2.7	2.3	9.7	<i>47e-1/5e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	2.6	2.2	5.7	11	30	120	120	120	120	120	180	AMaLGaM IDEA [4]
avg NEWUOA	100	240	<i>82e+0/7e3</i>	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.7	18	<i>66e+0/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	49	83	<i>15e+1/800</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.1	6.1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	110	68	<i>40e+0/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	96	370	1800	<i>28e+0/4e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	2.3	38	<i>79e+0/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	2	820	180	<i>55e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	180	140	<i>77e+0/1e4</i>	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	2.3	2.3	<i>68e+0/400</i>	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.8	31	12	20	29	180	180	180	180	180	170	iAMaLGaM IDEA [4]
MA-LS-Chain	2.7	1.4	10	<i>67e-1/5e4</i>	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	20	<i>39e+0/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	32	110	<i>88e+0/4e3</i>	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	110	61	2e3	<i>16e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1.7	510	<i>70e+0/1e5</i>	.	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	2.1	500	<i>49e+0/1e5</i>	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	2.5	1	520	<i>11e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	2.1	120	<i>39e+0/1e4</i>	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	2.4	2.8	<i>51e+0/500</i>	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1.4	170	190	<i>42e-1/5e6</i>	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 105: 10-D, running time excess ERT/ERT_{best} on f_{115} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	115 Step-ellipsoid Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.1	3.81	39.8	290	859	1230	1260	1260	1260	1280	ERT_{best}/D	
ALPS	2.1	14	11	490	<i>61e-2/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	2	4.3	1.8	3.9	3.6	4.3	4.3	4.3	4.3	4.2	AMaLGaM IDEA [4]	
avg NEWUOA	7	2.6	4.2	390	<i>24e-1/7e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.9	9.6	11	<i>40e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	150	1400	<i>11e+1/2e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.5	2	1	4.5	6.9	5.5	5.4	5.4	5.4	5.6	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	4	7.7	12	<i>21e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	35	140	8300	<i>77e-1/5e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1.9	6.5	7	16	<i>12e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	2	5.2	27	4800	<i>19e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	16	2	3.7	140	<i>13e-1/1e4</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	2.4	6.1	4.1	<i>56e-1/500</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.9	2.8	1.4	1.5	4.4	13	14	14	14	14	iAMaLGaM IDEA [4]	
MA-LS-Chain	1.9	3.8	3.7	42	260	<i>59e-2/5e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	300	<i>12e+0/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	11	2.4	19	<i>41e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	7.3	1.6	17	2900	<i>88e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1.7	2.6	640	<i>32e-1/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1.9	3	1400	<i>64e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1.9	13	6.6e4	<i>11e+0/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	3.2	2	1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	2.3	4.8	89	<i>16e+0/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1.4	6.5	1.9	13	38	56	64	64	64	65	VNS (Garcia) [10]	

Table 106: 10-D, running time excess ERT/ERT_{best} on f_{116} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

116 Ellipsoid Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	105	1650	7140	10600	10900	11300	11600	11900	12300	16700	ERT_{best}/D
ALPS	4.8	5	15	160	<i>15e-1/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLgAM IDEA	1	1	1	1	1	1	1	1	1	1	AMaLgAM IDEA [4]
avg NEWUOA	970	<i>35e+2/7e3</i>	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	16	18	<i>68e+1/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>10e+3/800</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	5.1	2.2	1.3	1.3	1.6	1.7	1.7	1.7	1.7	1.3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	130	<i>86e+1/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	6200	<i>10e+2/4e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	13	18	<i>63e+1/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	150	390	200	<i>46e+1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1400	<i>25e+2/1e4</i>	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	<i>31e+2/500</i>	.	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLgAM IDEA	1.7	2.5	2.8	2.7	3	3.4	3.5	3.5	3.7	2.8	iAMaLgAM IDEA [4]
MA-LS-Chain	5.2	15	33	<i>30e+0/5e4</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	45	<i>99e+1/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	<i>28e+2/4e3</i>	.	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	330	<i>28e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	530	890	<i>59e+1/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	240	850	<i>46e+1/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	530	<i>40e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	46	16	<i>17e+1/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	9.3	<i>18e+2/500</i>	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	87	54	1400	<i>12e+0/5e6</i>	.	.	.	.	.	.	VNS (Garcia) [10]

Table 107: 10-D, running time excess ERT/ERT_{best} on f_{117} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

117 Ellipsoid unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	2240	10100	22800	39900	48900	62600	65400	68700	71700	79400	ERT_{best}/D
ALPS	1.2	160	<i>12e+1/5e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	2.3	4.2	7	6.5	13	30	100	<i>31e-3/1e6</i>	.	.	AMaLGaM IDEA [4]
avg NEWUOA	<i>46e+2/7e3</i>	.	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	<i>28e+2/2e3</i>	.	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>14e+3/500</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	65	<i>25e+2/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1400	<i>15e+2/4e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>39e+2/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	53	<i>97e+1/1e5</i>	.	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	64	<i>62e+2/1e4</i>	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	<i>38e+2/400</i>	.	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	4	11	9.5	14	24	51	110	<i>33e-3/1e6</i>	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1.1	<i>36e+1/5e4</i>	.	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	5.5	<i>20e+2/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	27	<i>51e+2/4e3</i>	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	96	<i>61e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	130	<i>18e+2/1e5</i>	.	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	180	<i>19e+2/1e5</i>	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	13	<i>35e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	21	<i>15e+2/1e4</i>	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNObFIT	<i>33e+2/500</i>	.	.	.	.	.	.	.	.	.	SNObFIT [17]
VNS (Garcia)	28	1600	<i>16e+1/5e6</i>	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 108: 10-D, running time excess ERT/ERT_{best} on f_{118} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

118 Ellipsoid Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	10.6	31.2	135	324	434	530	610	651	707	806	ERT_{best}/D
ALPS	34	40	260	2.2e4	<i>30e-1/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	4.8	3.6	1.3	2.9	4.4	9.6	12	12	20	34	AMaLGaM IDEA [4]
avg NEWUOA	1	3.2	17	<i>37e-1/9e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	98	<i>59e+1/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>71e+2/2e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	6.2	5.6	3.2	2.2	2.2	2.1	2	2	1.9	1.8	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.7	18	350	<i>13e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	110	4900	<i>58e+0/7e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	14	61	<i>72e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	52	72	<i>29e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	14	430	<i>48e-1/1e4</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	3.8	5.3	50	<i>16e+0/1e3</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	3.7	2.8	1	2.2	5.1	18	30	54	59	140	iAMaLGaM IDEA [4]
MA-LS-Chain	6.7	12	16	130	780	<i>64e-2/5e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	140	<i>65e+1/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1.2	3.9	57	<i>99e-1/5e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	4.9	150	5e4	<i>16e+0/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	6.7	2300	1e4	<i>54e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	18	1700	<i>63e+0/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	2200	<i>34e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	5.6	7.8	3.4	2.1	1.8	1.7	1.5	1.5	1.5	1.4	IPOP-SEP-CMA-ES [21]
SNOBFIT	16	<i>40e+1/500</i>	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	7.1	4.3	1.7	1	1	1	1	1	1	1	VNS (Garcia) [10]

Table 109: 10-D, running time excess ERT/ERT_{best} on f_{119} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

119 Sum of different powers Gauss												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.1	0.1	12.8	312	497	1120	3650	17900	30100	4e4	ERT_{best}/D	
ALPS	1	2.9	3.4	4.1	8	11	44	<i>43e-5/5e5</i>	.	.	ALPS [15]	
AMaLGaM IDEA	1	2.7	2.1	8.5	14	8.3	3.9	1.3	1.2	1.1	AMaLGaM IDEA [4]	
avg NEWUOA	1	25	200	<i>65e-1/7e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	2.5	6.6	2.6	4.1	<i>67e-3/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	1.7	270	<i>13e+0/2e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	7.5	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	66	87	<i>31e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	750	1100	<i>33e-1/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1.1	2.5	5.9	6.6	<i>80e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	2.7	4.6	83	110	83	180	<i>64e-4/1e5</i>	.	.	EDA-PSO [5]	
full NEWUOA	1	120	160	<i>55e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	3.4	8.7	<i>54e-1/600</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	3.1	1.4	10	38	24	13	3.5	2.4	2.2	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	4	1.7	3.2	8.8	9.3	9.1	<i>49e-5/5e4</i>	.	.	MA-LS-Chain [19]	
MCS (Neum)	1	1	18	<i>56e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	11	120	<i>60e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1.5	170	44	4.6e4	<i>13e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	3.3	1.4	230	330	380	<i>38e-2/1e5</i>	.	.	.	PSO [6]	
PSO_Bounds	1.1	3.1	560	890	2800	<i>28e-1/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	3.1	7.5	4.7e4	<i>14e-1/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	7.1	34	11	13	7.1	20	<i>54e-4/1e4</i>	.	.	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	4.3	7.6	<i>52e-1/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	3	2.6	18	41	180	2900	<i>10e-4/7e6</i>	.	.	VNS (Garcia) [10]	

Table 110: 10-D, running time excess ERT/ERT_{best} on f_{120} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

Δf_{target} ERT_{best}/D	120 Sum of different powers unif										Δf_{target} ERT_{best}/D
	1e+03 0.1	1e+02 0.1	1e+01 47.1	1e+00 3990	1e-01 7460	1e-02 15700	1e-03 43900	1e-04 93000	1e-05 1.27e5	1e-07 2.5e5	
ALPS	1	2.8	1.7	48	<i>62e-2/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.9	6.4	16	39	130	<i>32e-3/1e6</i>	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	440	160	<i>97e-1/7e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	2.8	13	<i>77e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	110	260	<i>15e+0/800</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	17	4.1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	220	64	<i>63e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	43	460	<i>46e-1/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	2.5	21	<i>63e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	2.8	330	160	<i>47e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	440	310	<i>99e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	2.3	2.3	<i>79e-1/500</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	2.8	15	29	98	290	<i>47e-3/1e6</i>	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	5.1	1	18	<i>10e-1/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	59	<i>81e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	180	150	<i>11e+0/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	220	46	3700	<i>23e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	3.2	330	350	<i>48e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	2.6	770	<i>61e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	2.7	2	<i>15e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	2100	98	<i>52e-1/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	3.1	4.1	<i>69e-1/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	3	97	380	<i>63e-2/6e6</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 111: 10-D, running time excess ERT/ERT_{best} on f_{121} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
	0.1	0.1	7.24	31.7	63.1	148	368	694	999	1820	
ALPS	1.1	3.3	9.6	81	<i>25e-2/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	2.1	3.2	11	30	44	32	39	46	43	AMaLGaM IDEA [4]
avg NEWUOA	1	15	2.1	150	1700	<i>76e-2/7e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.7	8.6	22	30	64	<i>41e-3/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	1	400	570	<i>10e+0/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	5.4	1.1	1	1.1	1.1	1.1	1.4	1.9	2.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	4.7	4	41	<i>49e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	45	580	<i>26e-1/5e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	2.2	4.6	8.8	140	<i>17e-2/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1	2.9	2.3	9400	<i>14e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	32	10	140	<i>55e-2/1e4</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.9	3.8	18	<i>11e-1/300</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	2.9	1.6	3.4	21	72	94	87	130	120	iAMaLGaM IDEA [4]
MA-LS-Chain	1	2.7	2.5	4.8	43	<i>28e-3/5e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	7.1	<i>22e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	7.9	3.4	220	<i>11e-1/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	11	3.3	54	2.8e4	<i>10e-2/1e6</i>	.	.	.	.	(1+1)-ES [1]
PSO	1	2.9	1.7	7400	<i>13e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	2.9	4.9	<i>20e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	3	9.6	<i>15e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	4.1	1	1	1	1	1.2	1.1	1.1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	3.5	4.4	<i>26e-1/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	3	3.5	1.6	1.4	1.1	1	1	1	1	VNS (Garcia) [10]

Table 112: 10-D, running time excess ERT/ERT_{best} on f_{122} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

122 Schaffer F7 Gauss											
Δft_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δft_{target}
ERT_{best}/D	0.1	0.1	5.53	1160	3320	9790	14100	17600	43900	81700	ERT_{best}/D
ALPS	1	1.3	1.9	17	690	<i>12e-2/5e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.3	1.7	4.2	10	6.2	5	4.2	2.3	5.4	AMaLGaM IDEA [4]
avg NEWUOA	1	3.7	28	<i>42e-1/7e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.2	1.4	2.4	<i>85e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	11	140	<i>82e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.7	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.5	24	<i>40e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	350	<i>38e-1/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.1	3.8	<i>27e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.1	3.4	200	<i>16e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	10	65	<i>49e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.1	2.4	<i>50e-1/600</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	1	11	27	11	8.6	7.7	3.4	7	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1.2	17	<i>56e-2/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	3.3	<i>37e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	2.5	45	<i>47e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	20	<i>19e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1.1	1.7	610	<i>25e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	4.1	580	<i>24e-1/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.2	2.8	<i>20e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.1	39	18	<i>14e-1/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	4.2	<i>49e-1/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	3.7	150	2.9e4	<i>24e-2/7e6</i>	.	.	.	.	VNS (Garcia) [10]

Table 113: 10-D, running time excess ERT/ERT_{best} on f_{123} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

123 Schaffer F7 unif											
$\Delta ftarget$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta ftarget$
ERT_{best}/D	0.1	0.1	3.99	9440	38900	66500	1.29e5	1.99e5	3.33e5	1.03e6	ERT_{best}/D
ALPS	1	1.1	2.4	<i>15e-1/5e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.9	3	34	<i>68e-2/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1.3	180	<i>68e-1/7e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.1	9.3	<i>57e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	11	150	<i>87e-1/900</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	2.2	18	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.2	140	<i>48e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	2.7	290	<i>37e-1/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.2	64	<i>50e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.3	3.7	<i>48e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	91	350	<i>60e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	5	<i>53e-1/400</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.3	5.9	79	<i>85e-2/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1	<i>19e-1/5e4</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	37	<i>47e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	31	190	<i>64e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	17	76	<i>25e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1.3	2.8	<i>43e-1/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1.1	6.1	<i>56e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.1	3.1	<i>20e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.6	160	<i>44e-1/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	5.4	<i>53e-1/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	350	<i>15e-1/6e6</i>	.	.	.	.	.	.	VNS (Garcia) [10]

Table 114: 10-D, running time excess ERT/ERT_{best} on f_{124} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

124 Schaffer F7 Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.1	0.1	3.73	61.4	1050	3430	5290	7380	13700	33100	ERT_{best}/D
ALPS	1	1.2	2.8	7200	<i>99e-2/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.3	2.5	6.7	4.9	4.6	7.6	10	7.9	7.4	AMaLGaM IDEA [4]
avg NEWUOA	1	3.5	12	<i>24e-1/7e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.3	2.8	10	2.7	8.7	<i>74e-3/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	1	6.9	460	<i>89e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	2.1	1.8	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	3.3	9	2400	<i>19e-1/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	210	<i>31e-1/5e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.4	3.6	50	<i>97e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1.1	1.2	2.3	<i>31e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	9.2	<i>23e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.3	3.2	<i>33e-1/500</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.1	1.5	12	16	17	26	27	17	8.6	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1.7	130	<i>62e-2/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	<i>25e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	5	11	<i>34e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	9.8	6.8	1.2e4	<i>93e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1.4	1.3	<i>27e-1/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	2.4	<i>34e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.3	2.5	<i>22e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.3	1.8	5.5	2.3	1.5	1.5	2.2	5.3	<i>86e-6/1e4</i>	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.5	2	<i>28e-1/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	4.1	1.5	8.6	46	520	<i>64e-5/6e6</i>	.	.	VNS (Garcia) [10]

Table 115: 10-D, running time excess ERT/ERT_{best} on f_{125} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

125 Griewank-Rosenbrock Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.1	0.1	0.1	0.1	0.1	1.05e5	2.97e5	6.38e5	6.4e5	6.44e5	ERT_{best}/D
ALPS	1	1	1.1	490	<i>3.4e7</i>	<i>12e-2/5e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1.1	160	1.1e6	<i>42e-3/1e6</i>	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1	5.9	39	<i>19e-2/7e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.1	220	<i>24e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	1.7	4.1e4	<i>97e-2/3e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	110	5e5	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	3e3	<i>40e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	2.9	8.9e4	<i>40e-2/4e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1	1.1	290	<i>41e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1	310	7e6	<i>12e-2/1e5</i>	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	9.8	240	<i>20e-2/1e4</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.3	1200	<i>69e-2/500</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.2	110	1.9e6	130	<i>37e-3/1e6</i>	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	170	8.5e5	<i>10e-2/5e4</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	<i>25e-3/4e3</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	3.8	84	<i>22e-2/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	1	3e3	<i>25e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1.1	250	<i>21e-2/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1.2	320	1.5e7	<i>17e-2/1e5</i>	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1	1400	<i>28e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	89	7.3e5	<i>22e-2/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.1	380	<i>58e-2/500</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1.4	300	2.2e7	<i>76e-3/8e6</i>	.	.	.	.	VNS (Garcia) [10]

Table 116: 10-D, running time excess ERT/ERT_{best} on f_{126} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

126 Griewank-Rosenbrock unif											
Δft_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δft_{target}
ERT_{best}/D	0.1	0.1	0.1	0.1	0.1	nan	nan	nan	nan	nan	ERT_{best}/D
ALPS	1	1	1	510	<i>21e-2/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1.3	220	<i>4.9e7</i>	11e-2/1e6	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1	9.4	4.9e4	<i>89e-2/7e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.1	310	<i>59e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	6.1	1.6e4	<i>11e-1/1e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	870	3.9e6	<i>84e-3/7e5</i>	.	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	4500	<i>53e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	1.2	1.1e5	<i>47e-2/4e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1	1.1	1e3	<i>77e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1	2600	1.5e7	<i>41e-2/1e5</i>	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	28	7.1e4	<i>75e-2/1e4</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	1500	<i>78e-2/500</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.3	200	<i>3.3e7</i>	13e-2/1e6	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	190	<i>22e-2/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	25e-3/4e3	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	29	1.2e4	<i>66e-2/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	1	6800	<i>30e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1.3	950	<i>34e-2/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1	1.5e5	<i>61e-2/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1.1	980	<i>31e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1.1	1.3e4	<i>41e-2/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNBFFIT	1	1	1.2	670	<i>73e-2/500</i>	.	.	.	.	.	SNBFFIT [17]
VNS (Garcia)	1	1	1.4	1.8e4	<i>16e-2/7e6</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 117: 10-D, running time excess ERT/ERT_{best} on f_{127} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

127 Griewank-Rosenbrock Cauchy											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
	0.1	0.1	0.1	0.1	0.1	79900	1.35e5	2.06e5	2.08e5	2.11e5	
ALPS	1	1	1	370	<i>17e-2/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1	150	1.3e5	5.5	25	34	34	34	AMaLGaM IDEA [4]
avg NEWUOA	1	1	1	40	<i>20e-2/7e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.2	240	<i>21e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	60	5.8e4	<i>11e-1/2e3</i>	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	54	8.5e4	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	790	<i>39e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	10	5.8e4	<i>46e-2/4e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1	1.1	280	<i>33e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.1	92	<i>29e-2/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	1	69	<i>23e-2/1e4</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	880	<i>68e-2/500</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1	90	4e5	15	23	22	21	21	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	130	<i>19e-2/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	<i>25e-3/4e3</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	2.4	79	<i>25e-2/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	2.5	850	<i>19e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1.1	570	<i>32e-2/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1	530	<i>40e-2/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1.1	1200	<i>33e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	47	3.7e4	1.8	<i>34e-3/1e4</i>	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1	250	<i>65e-2/500</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1.4	220	3.8e5	93	<i>96e-4/7e6</i>	.	.	.	VNS (Garcia) [10]

Table 118: 10-D, running time excess ERT/ERT_{best} on f_{128} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

128 Gallagher Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.1	0.1	915	13800	14000	14400	29200	29300	38300	52900	ERT_{best}/D
ALPS	1	1	3.8	1.7	1.9	2	1.1	1.2	1	1	ALPS [15]
AMaLGaM IDEA	1	1	5	5.1	5.4	5.4	2.8	2.8	2.1	1.6	AMaLGaM IDEA [4]
avg NEWUOA	1	1	32	<i>21e+0/7e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	2.6	2.2	<i>93e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	<i>57e+0/2e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	6.4	6.6	6.4	3.2	3.2	2.4	1.8	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	25	<i>15e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	400	<i>91e-1/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	5.2	1	1	1	1	1	<i>15e+0/2e3</i>	.	DEPSO [11]
EDA-PSO	1	1	310	100	100	97	48	48	37	27	EDA-PSO [5]
full NEWUOA	1	1	77	<i>23e+0/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	8.6	<i>22e+0/500</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	14	6	11	11	5.7	5.8	4.4	3.3	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	4.1	2.9	3	3.1	1.6	1.6	1.2	1	MA-LS-Chain [19]
MCS (Neum)	1	1	14	4.1	<i>13e+0/4e3</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	<i>24e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	36	120	<i>16e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	230	<i>16e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	220	<i>19e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	11	1100	<i>20e-1/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	11	3.2	4.9	10	5	5	3.8	2.8	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	4	<i>22e+0/500</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	31	9	9.1	11	7	10	13	14	VNS (Garcia) [10]

Table 119: 10-D, running time excess ERT/ERT_{best} on f_{129} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	129 Gallagher unif											
$\Delta ftarget$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta ftarget$	
ERT_{best}/D	0.1	0.1	5400	1.36e5	1.41e5	1.42e5	1.43e5	1.44e5	1.45e5	1.47e5	ERT_{best}/D	
ALPS	1	1	2	26	<i>23e-1/5e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	12	6.1	14	23	23	23	31	100	AMaLGaM IDEA [4]	
avg NEWUOA	1	1	<i>39e+0/7e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	<i>30e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	<i>46e+0/900</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	1	<i>18e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	360	<i>13e+0/4e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	5.5	<i>24e+0/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	260	<i>20e+0/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	<i>41e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	<i>28e+0/400</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	12	18	47	100	99	99	98	97	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1	1.7	5.3	<i>48e-1/5e4</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	<i>21e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	<i>39e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	21	110	<i>56e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	260	<i>18e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	260	<i>26e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1.3	32	<i>20e-1/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	13	<i>22e+0/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	<i>27e+0/500</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	42	69	<i>72e-2/7e6</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 120: 10-D, running time excess ERT/ERT_{best} on f_{130} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

130 Gallagher Cauchy												
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D	
	0.1	0.1	48.1	588	3750	7050	7090	7150	7220	7330		
ALPS	1	1	6.7	9	67	<i>62e-3/5e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	8	170	35	19	19	20	20	20	AMaLGaM IDEA [4]	
avg NEWUOA	1	1	1.9	6	8.6	<i>41e-2/7e3</i>	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	17	23	<i>20e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	100	<i>10e+0/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	4.9	34	18	9.7	9.6	9.6	9.5	9.4	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	1	2.5	6.5	11	<i>51e-2/1e4</i>	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	590	<i>30e-1/5e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	8.3	10	1.8	<i>19e-1/2e3</i>	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	380	680	<i>53e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	6.7	8.3	5.1	<i>12e-2/1e4</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1	1	1	<i>50e-2/600</i>	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1	4.4	1.5	1.8	8.4	11	12	21	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1	4.7	19	7.1	3.9	5.2	15	<i>15e-5/5e4</i>	.	MA-LS-Chain [19]	
MCS (Neum)	1	1	32	<i>30e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	2.6	11	8	8.8	8.7	<i>14e-1/4e3</i>	.	.	NEWUOA [23]	
(1+1)-ES	1	1	1.7	4.6	24	460	<i>18e-3/1e6</i>	.	.	.	(1+1)-ES [1]	
PSO	1	1	180	680	190	<i>25e-1/1e5</i>	.	.	.	.	PSO [6]
PSO_Bounds	1	1	770	<i>69e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	160	<i>2.4e4</i>	<i>21e-1/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	2.3	11	1.9	1	1	1	1	1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	1	2.2	12	<i>28e-1/500</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	97	210	38	20	20	20	20	19	VNS (Garcia) [10]	

Table 121: 20-D, running time excess ERT/ERT_{best} on f_{101} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

101 Sphere moderate Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.05	0.28	2.96	18	24.4	29.7	32.8	35.8	37	39.1	ERT_{best}/D
ALPS	1	91	100	38	44	51	60	68	79	100	ALPS [15]
AMaLGaM IDEA	1	59	57	18	20	21	22	24	26	31	AMaLGaM IDEA [4]
avg NEWUOA	1	19	3.3	1.2	1	1	1	1	1	1.1	avg NEWUOA [23]
BayEDAcG	1	93	110	31	32	34	51	53	58	760	BayEDAcG [9]
BFGS	1	2.1e4	<i>11e+1/3e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	14	6.1	1.8	1.9	2	2.2	2.4	2.7	3.3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	15	4.4	1.2	1.2	1.3	1.4	1.5	1.7	2.1	(1+1)-CMA-ES [2]
DASA	1	63	22	6	6.3	6.9	8.3	9.8	12	16	DASA [18]
DEPSO	1	32	23	10	16	23	35	50	110	<i>27e-6/2e3</i>	DEPSO [11]
EDA-PSO	1	19	260	120	140	160	180	210	240	290	EDA-PSO [5]
full NEWUOA	1	43	5.8	1.7	1.4	1.1	1.1	1	1	1	full NEWUOA [23]
GLOBAL	1	34	9.1	3.5	5.3	7.1	7.8	8.9	19	250	GLOBAL [20]
iAMaLGaM IDEA	1	22	23	7.4	8.1	8.7	10	11	12	15	iAMaLGaM IDEA [4]
MA-LS-Chain	1	20	17	6.2	7	7.4	8.4	8.9	9.5	11	MA-LS-Chain [19]
MCS (Neum)	1	1	1	330	<i>11e-1/4e3</i>	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	8.9	3.1	1	1.1	1.1	1.2	1.2	1.5	1.6	NEWUOA [23]
(1+1)-ES	1	16	4.9	1.2	1.2	1.2	1.3	1.4	1.5	1.9	(1+1)-ES [1]
PSO	1	15	16	8.6	11	13	16	19	22	28	PSO [6]
PSO_Bounds	1	15	91	200	220	230	240	260	300	880	PSO_Bounds [7]
Monte Carlo	1	120	<i>29e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	12	5.5	1.6	1.6	1.7	1.9	2.1	2.4	2.9	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	21	52	43	32	28	110	100	<i>37e-1/300</i>	.	SNOBFIT [17]
VNS (Garcia)	1	35	8.5	2.2	2.2	2.3	2.5	2.6	2.9	3.5	VNS (Garcia) [10]

Table 122: 20-D, running time excess ERT/ERT_{best} on f_{102} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

102 Sphere moderate unif												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.05	0.29	10.6	19.9	26.8	34.2	40.4	48.9	57.9	70.3	ERT_{best}/D	
ALPS	1	61	29	34	41	44	50	52	53	59	ALPS [15]	
AMaLGaM IDEA	1	46	18	19	21	21	21	20	19	19	AMaLGaM IDEA [4]	
avg NEWUOA	1	19	1	1.1	1	1	1	1	1.1	1.3	avg NEWUOA [23]	
BayEDAcG	1	52	30	27	29	33	34	36	37	430	BayEDAcG [9]	
BFGS	1	6.4e4	<i>12e+1/3e3</i>	.	.	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	1	13	1.7	1.6	1.7	1.8	1.8	1.8	1.8	1.8	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	12	1.1	1	1.1	1.1	1.2	1.1	1.1	1.6	(1+1)-CMA-ES [2]	
DASA	1	72	8.2	7.4	8.5	8.9	11	12	17	34	DASA [18]	
DEPSO	1	35	6.9	8.8	14	21	37	53	170	<i>46e-6/2e3</i>	DEPSO [11]	
EDA-PSO	1	20	74	460	390	350	330	300	280	270	EDA-PSO [5]	
full NEWUOA	1	42	1.7	1.7	1.4	1.2	1.1	1	1	1	full NEWUOA [23]	
GLOBAL	1	42	3.1	5.4	14	56	<i>24e-3/600</i>	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	1	18	6.1	6.4	7.2	7.5	8	7.9	7.8	8.2	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	19	5.6	6.3	7.5	7.5	7.3	7	6.5	6.4	MA-LS-Chain [19]	
MCS (Neum)	1	1	9	800	<i>25e-1/4e3</i>	.	.	.	.	.	MCS (Neum) [16]	
NEWUOA	1	9.7	3.1	6.1	6.8	24	52	510	<i>31e-5/5e3</i>	.	NEWUOA [23]	
(1+1)-ES	1	34	2.9	4	6	15	23	67	290	6700	(1+1)-ES [1]	
PSO	1	19	4.9	370	280	220	190	160	140	120	PSO [6]	
PSO_Bounds	1	15	21	270	680	570	510	440	390	640	PSO_Bounds [7]	
Monte Carlo	1	110	<i>27e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	13	1.7	1.5	1.5	1.6	1.6	1.6	1.5	1.6	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	35	79	<i>18e+0/300</i>	.	.	.	.	.	.	SNOBFIT [17]	
VNS (Garcia)	1	36	2.5	2	2	2	2	1.9	1.9	2	VNS (Garcia) [10]	

Table 123: 20-D, running time excess ERT/ERT_{best} on f_{103} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	103 Sphere moderate Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	0.05	0.28	3.27	19.8	31.4	52.1	65.7	80.2	94.7	123	ERT_{best}/D	
ALPS	1	90	93	36	36	3600	<i>81e-4/2e5</i>	.	.	.	ALPS [15]	
AMaLGaM IDEA	1	61	62	18	15	11	19	51	81	110	AMaLGaM IDEA [4]	
avg NEWUOA	1	19	3	1	2	20	660	<i>14e-4/1e4</i>	.	.	avg NEWUOA [23]	
BayEDAcG	1	73	100	28	29	25	26	25	23	<i>95e-8/2e3</i>	BayEDAcG [9]	
BFGS	1	510	46	8.8	5.9	3.5	2.8	2.3	1.9	1.5	BFGS [22]	
BIPOP-CMA-ES	1	15	5.5	1.7	1.5	1.2	1.2	1.2	1.2	1.2	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	15	3.7	1.1	2.5	12	690	<i>16e-4/1e4</i>	.	.	(1+1)-CMA-ES [2]	
DASA	1	64	17	6.6	87	5800	<i>75e-4/4e5</i>	.	.	.	DASA [18]	
DEPSO	1	42	20	9.5	38	<i>34e-3/2e3</i>	.	.	.	.	DEPSO [11]	
EDA-PSO	1	29	250	110	110	<i>28e-3/1e5</i>	.	.	.	.	EDA-PSO [5]	
full NEWUOA	1	44	5.2	1.6	1.1	1.2	7.8	29	97	550	full NEWUOA [23]	
GLOBAL	1	120	17	4.1	4	2.4	2	1.6	1.4	1.1	GLOBAL [20]	
iAMaLGaM IDEA	1	20	20	6.3	7.6	9.7	21	34	160	420	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	19	14	5.4	5.7	4.7	6	9.3	35	480	MA-LS-Chain [19]	
MCS (Neum)	1	1	1	31	26	15	35	83	91	450	MCS (Neum) [16]	
NEWUOA	1	9.5	2.3	1.1	5.9	44	1200	<i>48e-4/5e3</i>	.	.	NEWUOA [23]	
(1+1)-ES	1	15	3.4	1.2	1.7	21	4300	<i>42e-5/1e6</i>	.	.	(1+1)-ES [1]	
PSO	1	14	14	460	1700	<i>66e-3/1e5</i>	.	.	.	.	PSO [6]	
PSO_Bounds	1	17	88	2700	<i>51e-2/1e5</i>	.	.	.	.	.	PSO_Bounds [7]	
Monte Carlo	1	160	<i>28e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	1	15	5	1.4	1.3	1	1	1	1	1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	1	25	8.9	1.5	1	1	1.7	2.6	3.5	8.6	SNOBFIT [17]	
VNS (Garcia)	1	37	7.7	1.9	1.6	1.2	1.3	1.2	1.3	1.3	VNS (Garcia) [10]	

Table 124: 20-D, running time excess ERT/ERT_{best} on f_{104} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

104 Rosenbrock moderate Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	5.1	48.2	1180	4280	8570	8900	9120	9290	9470	9810	ERT_{best}/D
ALPS	72	21	60	19	12	17	24	72	120	<i>31e-5/2e5</i>	ALPS [15]
AMaLGaM IDEA	30	7	4.7	1.9	1	1	1	1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	1.8	1.4	11	<i>98e-1/1e4</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	57	16	<i>26e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>13e+4/1e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.6	1.2	10	3.2	1.7	1.7	1.6	1.6	1.6	1.6	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.9	2.1	28	<i>12e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	18	11	2.8	3.6	4.3	22	44	160	<i>24e-5/6e5</i>	.	DASA [18]
DEPSO	17	8.2	<i>19e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	230	47	<i>16e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	3.2	1.2	20	<i>13e+0/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	5.3	2.2	1	1	1.7	1.7	<i>82e-1/900</i>	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	15	3	32	9.6	4.9	4.8	4.7	4.6	4.6	4.5	iAMaLGaM IDEA [4]
MA-LS-Chain	14	3.9	590	<i>14e+0/1e5</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	79	<i>20e+1/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1.5	68	<i>17e+0/6e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	2.9	1	45	440	770	<i>12e-1/1e6</i>	.	.	.	.	(1+1)-ES [1]
PSO	1400	330	340	<i>17e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	94	670	1200	330	<i>72e+0/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	<i>91e+2/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	4.1	21	<i>17e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	<i>63e+2/300</i>	.	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	5.6	1	<i>15e+0/7e5</i>	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 125: 20-D, running time excess ERT/ERT_{best} on f_{105} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

105 Rosenbrock moderate unif												
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}	
ERT_{best}/D	10.2	59	9590	30500	31600	32100	32500	32800	33000	33500	ERT_{best}/D	
ALPS	39	18	8.3	4	5.5	9.7	21	110	<i>60e-4/2e5</i>	.	.	ALPS [15]
AMaLGaM IDEA	15	5.1	120	46	45	57	57	56	56	56	56	AMaLGaM IDEA [4]
avg NEWUOA	1	1.6	7.2	<i>12e+0/1e4</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	30	16	<i>33e+0/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>15e+4/1e3</i>	.	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	2.3	1.5	2.7	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.5	1.7	15	<i>17e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	11	14	1.4	4.6	51	<i>26e-2/5e5</i>	.	.	.	.	.	DASA [18]
DEPSO	8.7	6.9	<i>20e+0/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	120	40	<i>17e+0/1e5</i>	.	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1.5	1	7.2	<i>14e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	2.7	2.5	1	<i>27e+0/700</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	7.3	2.3	1500	<i>13e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	7.4	4.4	150	49	<i>15e+0/1e5</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	77	<i>19e+1/4e3</i>	.	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1.5	7.2	<i>24e+0/5e3</i>	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	2.1	4.3	340	<i>13e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	7.6	7.1	68	<i>18e+0/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	44	960	<i>78e+0/1e5</i>	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	<i>88e+2/1e6</i>	.	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.8	6	<i>18e+0/1e4</i>	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	370	<i>32e+2/300</i>	.	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	2.9	33	<i>16e+0/7e5</i>	.	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 126: 20-D, running time excess ERT/ERT_{best} on f_{106} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

106 Rosenbrock moderate Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	5.97	24.8	574	1080	1190	1240	1270	1300	1320	1370	ERT_{best}/D
ALPS	62	41	76	130	940	<i>12e-2/2e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	25	12	640	1300	1200	1200	1500	1500	1500	1400	AMaLGaM IDEA [4]
avg NEWUOA	1.6	1.6	8.1	<i>74e-1/1e4</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	52	42	<i>51e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	810	<i>91e+1/4e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	4.2	2.6	1	1.3	1.4	1.4	1.5	1.5	1.5	1.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.4	1.7	15	<i>62e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	13	7.8	2.8	12	320	<i>76e-3/9e5</i>	.	.	.	.	DASA [18]
DEPSO	14	13	<i>25e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	200	95	<i>16e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	2.5	1.7	3.3	12	28	<i>97e-2/1e4</i>	.	.	.	.	full NEWUOA [23]
GLOBAL	5.3	4.6	1.9	5.4	<i>22e-1/1e3</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	12	5.5	130	6100	1.2e4	<i>47e-1/1e6</i>	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	11	8	8.2	18	29	160	1100	<i>15e-3/1e5</i>	.	.	MA-LS-Chain [19]
MCS (Neum)	190	<i>20e+1/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	7	31	<i>49e-1/8e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	2.3	1.2	8	210	<i>42e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	14	630	2400	<i>17e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	110	140	2500	<i>18e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	<i>98e+2/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	3.3	1.6	1.1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	150	<i>22e+2/300</i>	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	5	2.4	1	3.1	3	2.9	2.8	2.8	2.8	2.7	VNS (Garcia) [10]

Table 127: 20-D, running time excess ERT/ERT_{best} on f_{107} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

107 Sphere Gauss											
Δ_{ftarget}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δ_{ftarget}
ERT_{best}/D	0.05	8.85	429	679	811	1050	1370	2170	2620	3250	ERT_{best}/D
ALPS	1	2.8	9.2	67	820	3500	<i>14e-2/2e5</i>	.	.	.	ALPS [15]
AMaLGaM IDEA	1	3	10	25	43	38	36	27	23	21	AMaLGaM IDEA [4]
avg NEWUOA	1	110	<i>64e+0/9e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	3.2	2.4	22	<i>15e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	350	<i>11e+1/1e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	4.8	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	320	<i>75e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1800	<i>64e+0/3e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	6.4	<i>38e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	820	3500	<i>25e+0/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	320	<i>68e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	7.5	<i>82e+0/400</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.5	19	100	93	75	59	37	37	39	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	11	27	41	46	44	34	34	230	MA-LS-Chain [19]
MCS (Neum)	1	19	<i>64e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	96	<i>57e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	140	<i>34e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1700	<i>48e+0/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	15	<i>64e+0/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	4.8	<i>27e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	260	24	31	180	<i>11e-1/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	3.5	<i>65e+0/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	130	260	7600	<i>27e-1/7e5</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 128: 20-D, running time excess ERT/ERT_{best} on f_{108} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

108 Sphere unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.05	19.4	2900	4860	10200	19800	22300	25400	31500	44900	ERT_{best}/D
ALPS	1	1.4	<i>24e+0/2e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.3	30	160	<i>48e-2/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	700	<i>11e+1/9e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	10	<i>72e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	120	<i>11e+1/800</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	11	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	190	<i>80e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	870	<i>64e+0/3e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	43	<i>81e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	3400	<i>91e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1600	<i>11e+1/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	4.5	<i>80e+0/300</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	20	76	270	670	<i>85e-2/1e6</i>	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	<i>21e+0/1e5</i>	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	19	<i>69e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	260	<i>91e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	120	<i>41e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	3400	<i>95e+0/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	5900	<i>10e+1/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	2.2	<i>28e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	420	<i>72e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	2.5	<i>67e+0/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	630	<i>37e+0/7e5</i>	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 129: 20-D, running time excess ERT/ERT_{best} on f_{109} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

Δf_{target} ERT_{best}/D	109 Sphere Cauchy										Δf_{target} ERT_{best}/D
	1e+03 0.05	1e+02 0.28	1e+01 16.6	1e+00 31.6	1e-01 56.9	1e-02 84	1e-03 114	1e-04 150	1e-05 179	1e-07 248	
ALPS	1	70	20	<i>18e-1/2e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	61	9.1	26	46	67	63	53	65	69	AMaLGaM IDEA [4]
avg NEWUOA	1	19	17	<i>25e-1/9e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	93	20	23	25	27	24	100	<i>26e-5/2e3</i>	.	BayEDAcG [9]
BFGS	1	6700	610	490	560	380	280	210	180	130	BFGS [22]
BIPOP-CMA-ES	1	14	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	12	11	<i>16e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	960	4.2e4	<i>12e+0/3e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	49	7.2	97	<i>99e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	25	2500	<i>74e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	93	23	<i>29e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	50	3	190	<i>25e-1/400</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	25	4	8.5	20	63	310	440	430	370	iAMaLGaM IDEA [4]
MA-LS-Chain	1	20	3.9	4.9	860	<i>54e-3/1e5</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	20	280	980	670	490	<i>13e-1/4e3</i>	.	.	MCS (Neum) [16]
NEWUOA	1	9.8	17	<i>33e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	20	5.7	3800	<i>72e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	15	2600	<i>61e-1/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	41	2.4e4	<i>17e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	100	<i>28e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	11	1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	23	16	<i>94e-1/300</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	37	1.6	1.4	1.2	1.2	1.2	1.2	1.2	1.2	VNS (Garcia) [10]

Table 130: 20-D, running time excess ERT/ERT_{best} on f_{110} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	110 Rosenbrock Gauss										
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	5.7	53	<i>56e+0/2e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1.4	1.8	<i>18e+0/1e6</i>	.	.	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	<i>55e+3/9e3</i>	.	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	3.7	1.8	<i>70e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>14e+4/600</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	<i>17e+0/1e6</i>	.	.	.	.	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>46e+3/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>28e+3/3e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>72e+2/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	44	92	<i>11e+1/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	<i>65e+3/1e4</i>	.	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	<i>46e+3/300</i>	.	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1.1	5.7	<i>18e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	3.4	11	<i>28e+0/1e5</i>	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	<i>14e+3/4e3</i>	.	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	<i>19e+3/4e3</i>	.	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	<i>11e+3/1e6</i>	.	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	430	<i>85e+1/1e5</i>	.	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	3500	<i>58e+2/1e5</i>	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	<i>80e+2/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	18	14	<i>60e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	<i>36e+3/300</i>	.	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	25	130	<i>47e+0/7e5</i>	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 131: 20-D, running time excess ERT/ERT_{best} on f_{111} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	111 Rosenbrock unif										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	1020	4350	nan	nan	nan	nan	nan	nan	nan	nan	ERT_{best}/D
ALPS	350	<i>99e+1/2e5</i>	.	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	7.4	12	<i>23e+0/1e6</i>	.	.	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	<i>94e+3/9e3</i>	.	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	29	<i>22e+2/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>15e+4/400</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	<i>18e+0/1e6</i>	.	.	.	.	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>44e+3/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>35e+3/3e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>77e+3/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	<i>36e+3/1e5</i>	.	.	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	<i>11e+4/1e4</i>	.	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	<i>58e+3/200</i>	.	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	18	33	<i>27e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1500	<i>17e+2/1e5</i>	.	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	<i>21e+3/4e3</i>	.	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	<i>63e+3/4e3</i>	.	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	<i>15e+3/1e6</i>	.	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	<i>51e+3/1e5</i>	.	.	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	<i>48e+3/1e5</i>	.	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	<i>94e+2/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	24	<i>15e+2/1e4</i>	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	<i>34e+3/300</i>	.	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	<i>76e+2/7e5</i>	.	.	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 132: 20-D, running time excess ERT/ERT_{best} on f_{112} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

112 Rosenbrock Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	6.61	43.3	1280	3210	3480	3610	3680	3740	3810	3910	ERT_{best}/D
ALPS	59	40	<i>21e+0/2e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	23	7.5	260	780	930	920	1200	1200	1200	1200	AMaLGaM IDEA [4]
avg NEWUOA	1.3	3	<i>20e+0/1e4</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	45	23	<i>48e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>14e+4/2e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	3.3	2.2	1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	2.3	3.7	<i>20e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	13	84	<i>18e+0/4e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	12	18	<i>37e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	180	54	<i>27e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	2.2	4.1	<i>19e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	4.4	2.3	2.2	<i>34e+0/500</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	11	3.3	540	560	520	500	490	480	480	460	iAMaLGaM IDEA [4]
MA-LS-Chain	10	4.6	<i>16e+0/1e5</i>	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	240	<i>20e+1/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	2.6	<i>29e+0/5e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	2.2	2.7	5300	<i>15e+0/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	12	1200	<i>78e+0/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	88	1.5e4	<i>24e+1/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	<i>76e+2/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	2.9	1	1.1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	87	<i>15e+2/300</i>	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	4.6	1.4	1.2	2.6	2.6	2.6	2.6	2.5	2.5	2.5	VNS (Garcia) [10]

Table 133: 20-D, running time excess ERT/ERT_{best} on f_{113} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	113 Step-ellipsoid Gauss										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.59	89.7	2510	18200	28000	29400	29400	29400	29400	29600	ERT_{best}/D
ALPS	3.8	8.7	34	<i>58e-1/2e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	4.6	1.8	2.7	1.2	1.2	2	2	2	2	2	AMaLGaM IDEA [4]
avg NEWUOA	430	<i>29e+1/9e3</i>	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	3.6	6.3	<i>19e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	240	<i>58e+1/1e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	6.7	2.9	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	430	<i>22e+1/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	2700	<i>20e+1/3e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	7.4	52	<i>14e+1/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	5.8	1100	<i>86e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	830	<i>38e+1/1e4</i>	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1.7	<i>28e+1/400</i>	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.9	1	5.1	4.3	4.1	5.2	5.2	5.2	5.2	5.2	iAMaLGaM IDEA [4]
MA-LS-Chain	2.4	6.1	26	<i>62e-1/1e5</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	58	630	<i>22e+1/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	300	<i>24e+1/4e3</i>	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	100	1.6e5	<i>13e+1/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	2.8	3400	<i>15e+1/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	2.6	1.6e4	<i>20e+1/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	3.9	1e4	<i>95e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	27	70	12	<i>21e+0/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	7.5	<i>32e+1/300</i>	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	74	1100	<i>12e+0/6e5</i>	.	.	.	.	.	.	VNS (Garcia) [10]

Table 134: 20-D, running time excess ERT/ERT_{best} on f_{114} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	114 Step-ellipsoid unif										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.59	1660	10400	55900	72300	78500	78500	78500	78500	79100	ERT_{best}/D
ALPS	3.7	49	<i>70e+0/2e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	3.2	3.2	12	34	62	89	89	89	89	89	AMaLGaM IDEA [4]
avg NEWUOA	700	<i>44e+1/9e3</i>	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	2.8	<i>32e+1/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	220	<i>67e+1/700</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	78	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	510	<i>34e+1/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	2300	<i>27e+1/3e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	32	<i>49e+1/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	3.6	<i>30e+1/1e5</i>	.	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1e3	<i>53e+1/1e4</i>	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	2.5	<i>36e+1/300</i>	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.8	12	42	260	<i>27e-1/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	3.2	13	<i>67e+0/1e5</i>	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	210	<i>30e+1/4e3</i>	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	370	<i>47e+1/4e3</i>	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	230	<i>16e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	80	<i>26e+1/1e5</i>	.	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1.2e4	<i>37e+1/1e5</i>	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	3.5	1500	<i>11e+1/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	2700	45	<i>17e+1/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	7.4	<i>37e+1/300</i>	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	910	<i>11e+1/6e5</i>	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 135: 20-D, running time excess ERT/ERT_{best} on f_{115} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	115 Step-ellipsoid Cauchy										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.53	10	120	1510	4590	6330	6340	6340	6340	6450	ERT_{best}/D
ALPS	4.1	20	320	<i>54e-1/2e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	3.3	11	2.1	1.2	1	1	1	1	1	1	AMaLGaM IDEA [4]
avg NEWUOA	7.2	1.5	110	<i>93e-1/1e4</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	2.6	22	22	<i>90e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1900	<i>62e+1/2e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	3.2	1.7	1	6.5	3.9	3	3	3	3	3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	3.9	6.2	<i>21e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	21	560	<i>41e+0/3e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	3.2	6.6	19	<i>93e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	2.7	40	3500	<i>16e+0/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	17	4.3	120	<i>10e+0/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	3.5	4.5	<i>29e+0/300</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.4	4.5	1.3	1.7	2.4	7	7	7	7	6.9	iAMaLGaM IDEA [4]
MA-LS-Chain	2.4	4.7	5.7	470	<i>15e-1/1e5</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	160	<i>72e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	3.3	1	240	<i>18e+0/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	7.5	8.3	1.2e5	<i>14e+0/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	2.1	390	<i>32e+0/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	2.7	19	<i>47e+0/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	3.1	2.5e5	<i>11e+1/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	2.5	1.8	1.3	1	1.9	1.4	1.4	1.4	1.4	1.4	IPOP-SEP-CMA-ES [21]
SNOBFIT	3.3	180	<i>14e+1/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1.1	2.4	4.6	100	350	1200	1200	1200	1200	1200	VNS (Garcia) [10]

Table 136: 20-D, running time excess ERT/ERT_{best} on f_{116} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	116 Ellipsoid Gauss										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	1810	9510	24900	34700	44600	50200	51700	52800	54000	56200	ERT_{best}/D
ALPS	9.8	<i>30e+1/2e5</i>	.	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1	1	1	1	1.2	1.4	1.4	1.4	AMaLGaM IDEA [4]
avg NEWUOA	<i>20e+3/9e3</i>	.	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	<i>24e+2/2e3</i>	.	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>55e+3/700</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.1	1.7	1.4	1.2	1.1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>16e+3/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>95e+2/3e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>16e+3/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	780	<i>41e+2/1e5</i>	.	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	<i>23e+3/1e4</i>	.	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	<i>23e+3/300</i>	.	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	2.4	5.4	3.7	2.9	2.5	2.5	2.5	2.5	2.4	2.6	iAMaLGaM IDEA [4]
MA-LS-Chain	25	<i>57e+1/1e5</i>	.	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	<i>12e+3/4e3</i>	.	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	<i>22e+3/4e3</i>	.	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	<i>59e+2/1e6</i>	.	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	<i>60e+2/1e5</i>	.	.	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	<i>72e+2/1e5</i>	.	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	<i>44e+2/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	26	<i>13e+2/1e4</i>	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	<i>18e+3/300</i>	.	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	670	<i>14e+2/5e5</i>	.	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 137: 20-D, running time excess ERT/ERT_{best} on f_{117} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

117 Ellipsoid unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	10100	35500	89300	1.23e5	1.3e5	1.38e5	1.45e5	1.54e5	1.62e5	1.81e5	ERT_{best}/D
ALPS	<i>32e+2/2e5</i>	.	.	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	3.1	5.7	14	17	<i>90e-1/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	<i>24e+3/9e3</i>	.	.	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	<i>13e+3/2e3</i>	.	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>49e+3/500</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>18e+3/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>12e+3/3e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>26e+3/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	<i>13e+3/1e5</i>	.	.	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	<i>32e+3/1e4</i>	.	.	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	<i>26e+3/200</i>	.	.	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	7.5	13	36	120	<i>19e+0/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	<i>36e+2/1e5</i>	.	.	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	<i>20e+3/4e3</i>	.	.	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	<i>26e+3/4e3</i>	.	.	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	<i>69e+2/1e6</i>	.	.	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	<i>15e+3/1e5</i>	.	.	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	<i>17e+3/1e5</i>	.	.	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	<i>44e+2/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	<i>99e+2/1e4</i>	.	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	<i>24e+3/300</i>	.	.	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	<i>94e+2/5e5</i>	.	.	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 138: 20-D, running time excess ERT/ERT_{best} on f_{118} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

118 Ellipsoid Cauchy												
$\Delta ftarget$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta ftarget$	
ERT_{best}/D	26.3	184	345	589	876	1110	1320	1390	1500	1630	ERT_{best}/D	
ALPS	32	340	<i>46e+0/2e5</i>	.	.	.	.	.	.	.	ALPS [15]	
AMaLGaM IDEA	6.9	1.9	1.4	1.9	2.9	6.8	7.3	7.3	8.8	8.8	AMaLGaM IDEA [4]	
avg NEWUOA	1.3	7.9	<i>43e+0/1e4</i>	.	.	.	.	.	.	.	avg NEWUOA [23]	
BayEDAcG	120	<i>10e+2/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]	
BFGS	<i>46e+3/2e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]	
BIPOP-CMA-ES	3.4	1.4	1.9	1.8	1.6	1.6	1.5	1.6	1.6	1.6	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	3.8	410	<i>13e+1/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]	
DASA	240	<i>32e+1/5e5</i>	.	.	.	.	.	.	.	.	DASA [18]	
DEPSO	18	<i>55e+1/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]	
EDA-PSO	58	3600	<i>31e+1/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]	
full NEWUOA	1	7.6	<i>44e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]	
GLOBAL	3	85	<i>15e+1/1e3</i>	.	.	.	.	.	.	.	GLOBAL [20]	
iAMaLGaM IDEA	3.9	1	2.4	4.4	6.9	14	34	40	47	44	iAMaLGaM IDEA [4]	
MA-LS-Chain	9	8.8	470	<i>10e+0/1e5</i>	.	.	.	.	.	.	MA-LS-Chain [19]	
MCS (Neum)	<i>26e+2/4e3</i>	.	.	.	.	.	.	.	.	.	MCS (Neum) [16]	
NEWUOA	1.2	7.9	<i>62e+0/6e3</i>	.	.	.	.	.	.	.	NEWUOA [23]	
(1+1)-ES	18	<i>18e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]	
PSO	600	<i>56e+1/1e5</i>	.	.	.	.	.	.	.	.	PSO [6]	
PSO_Bounds	2600	<i>78e+1/1e5</i>	.	.	.	.	.	.	.	.	PSO_Bounds [7]	
Monte Carlo	<i>53e+2/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]	
IPOP-SEP-CMA-ES	3.5	2.3	2.2	1.8	1.4	1.3	1.1	1.1	1.1	1	IPOP-SEP-CMA-ES [21]	
SNOBFIT	<i>54e+2/300</i>	.	.	.	.	.	.	.	.	.	SNOBFIT [17]	
VNS (Garcia)	3.6	1	1	1	1	1	1	1	1	1	VNS (Garcia) [10]	

Table 139: 20-D, running time excess ERT/ERT_{best} on f_{119} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

119 Sum of different powers Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.05	0.05	139	1470	1800	3160	20500	47100	7e4	95100	ERT_{best}/D
ALPS	1	6.4	3.6	55	960	<i>31e-2/2e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	3.8	1	6.8	12	15	3.1	1.4	1	1	AMaLGaM IDEA [4]
avg NEWUOA	1	300	<i>15e+0/9e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	5.7	2.7	3.9	<i>15e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	740	<i>43e+0/1e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	14	1.6	1	1	1	1	1	1.3	1.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	420	<i>17e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	2300	<i>2.7e4</i>	<i>17e+0/3e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	4.6	13	<i>83e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	6.6	680	<i>95e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	720	1e3	<i>18e+0/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	5.1	<i>21e+0/400</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	5.3	4.2	22	44	35	7.5	3.8	2.8	2.1	iAMaLGaM IDEA [4]
MA-LS-Chain	1	5.7	2.5	47	190	<i>13e-2/1e5</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	87	<i>14e+0/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	33	400	<i>18e+0/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	250	7300	<i>97e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	3.9	1100	<i>11e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	6.5	2e3	<i>12e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	5.7	1800	<i>84e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	21	41	20	83	<i>16e-1/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	4.9	<i>18e+0/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	3.6	140	1300	<i>18e-1/5e5</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 140: 20-D, running time excess ERT/ERT_{best} on f_{120} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	120 Sum of different powers unif										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.05	0.05	1800	8940	14100	42600	79600	2.7e5	3.37e5	6.75e5	ERT_{best}/D
ALPS	1	4.9	6.7	<i>58e-1/2e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	7.3	5.5	57	<i>37e-2/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	760	<i>29e+0/9e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1.1	4.6	<i>20e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	470	<i>34e+0/800</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	120	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	990	<i>20e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1300	<i>20e+0/3e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	9.7	<i>31e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	4.2	380	<i>27e+0/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	3300	<i>34e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	5.3	<i>24e+0/300</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	3.7	10	120	<i>39e-2/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	6.3	1.3	<i>56e-1/1e5</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	15	<i>15e+0/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	590	<i>30e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	420	2500	<i>11e+0/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	5.3	<i>27e+0/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	8.5	<i>25e+0/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1.1	3.9	120	<i>81e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	6300	41	<i>17e+0/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	3.5	<i>19e+0/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	3.6	450	<i>10e+0/6e5</i>	.	.	.	.	.	.	VNS (Garcia) [10]

Table 141: 20-D, running time excess ERT/ERT_{best} on f_{121} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	121 Sum of different powers Cauchy										
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.05	0.05	12.4	38.5	71.3	172	465	1100	1720	2870	ERT_{best}/D
ALPS	1	4.7	13	<i>20e-1/2e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	6.5	6.4	6	47	36	25	13	15	20	AMaLGaM IDEA [4]
avg NEWUOA	1	82	49	<i>40e-1/9e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	5.3	20	33	43	<i>58e-3/2e3</i>	.	.	.	.	BayEDAcG [9]
BFGS	1	2500	<i>33e+0/2e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	23	1.2	1	1.2	1.1	1.1	1.2	1.3	1.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	23	33	<i>32e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	65	7.6e4	<i>11e+0/3e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	10	7.7	130	<i>11e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	5.7	2e3	<i>50e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	130	73	<i>53e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	7.4	4.8	<i>62e-1/400</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	5.1	3.4	12	57	150	120	75	50	39	iAMaLGaM IDEA [4]
MA-LS-Chain	1	4.5	3.9	97	9700	<i>18e-2/1e5</i>	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	16	<i>60e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	29	31	<i>52e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1.1	25	17	<i>16e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	3.5	1800	<i>64e-1/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	4.7	4100	<i>85e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	3.9	2.6e4	<i>82e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	15	1	1	1	1	1.2	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	5.7	<i>16e+0/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	3.6	1.8	1.2	1.3	1.1	1	1.2	1.1	1.2	VNS (Garcia) [10]

Table 142: 20-D, running time excess ERT/ERT_{best} on f_{122} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	122 Schaffer F7 Gauss										
Δft_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δft_{target}
ERT_{best}/D	0.05	0.05	34.6	2600	6980	18800	39700	54200	99900	2.91e5	ERT_{best}/D
ALPS	1	1.4	2.3	<i>22e-1/2e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.3	1.4	16	19	11	5.8	4.5	6.6	5.4	AMaLGaM IDEA [4]
avg NEWUOA	1	2.3	120	<i>77e-1/9e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.1	2.4	<i>34e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	81	660	<i>13e+0/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.8	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.5	150	<i>82e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	60	1100	<i>75e-1/3e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.1	3.1	<i>63e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.3	23	<i>59e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	7	180	<i>76e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.3	8.4	<i>92e-1/400</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.3	1	44	32	16	10	8.7	14	24	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1	<i>27e-1/1e5</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	16	<i>77e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	6.8	82	<i>80e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	37	200	<i>57e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1.5	4.7	<i>67e-1/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1.3	740	<i>80e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.3	12	<i>49e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	5.2	65	<i>44e-1/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.1	7.3	<i>98e-1/300</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1.2	3.1	<i>36e-1/5e5</i>	.	.	.	.	.	.	VNS (Garcia) [10]

Table 143: 20-D, running time excess ERT/ERT_{best} on f_{123} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

	123 Schaffer F7 unif											
Δft_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δft_{target}	
ERT_{best}/D	0.05	0.05	53.1	26500	74400	1.63e5	2.64e5	4.89e5	1.36e6	7.92e6	ERT_{best}/D	
ALPS	1	1.6	3.1	<i>46e-1/2e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.4	1.9	550	<i>23e-1/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	130	410	<i>11e+0/9e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.4	14	<i>83e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	35	<i>14e+0/900</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	5.1	5.7	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	8.5	130	<i>94e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	140	620	<i>74e-1/3e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.3	270	<i>12e+0/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.4	5200	<i>13e+0/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	2.6	250	<i>99e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.2	7.3	<i>99e-1/300</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.5	12	<i>23e-1/1e6</i>	.	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.5	1	<i>45e-1/1e5</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	58	<i>87e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	53	170	<i>10e+0/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	53	200	<i>64e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1.3	730	<i>92e-1/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1.5	2200	<i>10e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.1	7.4	<i>53e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.5	150	<i>77e-1/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.4	7	<i>10e+0/300</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1.2	410	<i>58e-1/5e5</i>	.	.	.	.	.	.	VNS (Garcia) [10]

Table 144: 20-D, running time excess ERT/ERT_{best} on f_{124} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

124 Schaffer F7 Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.05	0.05	9.61	97.9	2040	3220	6350	14300	19400	4e4	ERT_{best}/D
ALPS	1	1.5	4.9	<i>28e-1/2e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.5	4.6	11	3.3	5	4.5	4.3	3.3	2.3	AMaLGaM IDEA [4]
avg NEWUOA	1	3.3	95	<i>59e-1/9e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1.1	8.7	13	<i>37e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	120	<i>13e+0/2e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	4.7	1.1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	3.7	14	<i>51e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	12	470	<i>69e-1/3e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.9	3.6	<i>28e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1.4	7.6	<i>60e-1/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1.5	120	<i>66e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1.5	4.1	<i>69e-1/300</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1.4	2.8	7.8	19	27	17	8.3	6.2	4.3	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1.3	1.2	1.5e4	<i>16e-1/1e5</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	12	<i>66e-1/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	10	91	<i>66e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	4.3	66	<i>36e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1.2	160	<i>54e-1/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1.7	35	<i>57e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1.1	46	<i>51e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	3.3	1	7.1	2.2	1.9	2.2	2.4	<i>41e-5/1e4</i>	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1.2	6.7	<i>85e-1/300</i>	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1.2	1.9	1	8.1	980	<i>24e-3/4e5</i>	.	.	.	VNS (Garcia) [10]

Table 145: 20-D, running time excess ERT/ERT_{best} on f_{125} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

125 Griewank-Rosenbrock Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.05	0.05	0.05	0.05	0.05	6.24e5	1.25e6	3.12e6	4.01e6	4.03e6	ERT_{best}/D
ALPS	1	1	1	2500	<i>38e-2/2e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1.1	1e3	<i>24e-2/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1	1	490	<i>45e-2/9e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.1	1800	<i>50e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	53	<i>21e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	380	9.8e6	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	1.9e5	<i>96e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	1.1	2.4e7	<i>11e-1/3e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1	1.2	7800	<i>81e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.2	3.1e5	<i>40e-2/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	1.7	860	<i>44e-2/1e4</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	<i>14e-1/400</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.1	680	<i>24e-2/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.2	1500	<i>39e-2/1e5</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	<i>25e-3/4e3</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	1	410	<i>49e-2/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	1	6.5e5	<i>75e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1.1	2.9e5	<i>72e-2/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1.1	1.4e6	<i>86e-2/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1	5.9e5	<i>80e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	2e4	<i>59e-2/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.1	1600	<i>91e-2/300</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	4.2e4	<i>44e-2/2e6</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 146: 20-D, running time excess ERT/ERT_{best} on f_{126} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

126 Griewank-Rosenbrock unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.05	0.05	0.05	0.05	0.05	nan	nan	nan	nan	nan	ERT_{best}/D
ALPS	1	1	1	2500	<i>57e-2/2e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1	1300	<i>31e-2/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1	120	2.6e6	<i>16e-1/9e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1	3.3e4	<i>94e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	23	<i>17e-1/1e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	5800	<i>30e-2/5e5</i>	.	.	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	1.4e6	<i>11e-1/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	81	7.7e7	<i>12e-1/3e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1	1.1	<i>13e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.2	2.3e6	<i>10e-1/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	310	<i>16e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	<i>14e-1/300</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1.1	5700	<i>34e-2/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	1.1	2500	<i>52e-2/1e5</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	<i>25e-3/4e3</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	4.2	1.3e5	<i>12e-1/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	1	3.1e6	<i>85e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1.1	3.1e6	<i>10e-1/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1	<i>14e-1/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1.1	3.2e5	<i>76e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	1.8e5	<i>89e-2/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1	1400	<i>86e-2/300</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	1.3e6	<i>67e-2/2e6</i>	.	.	.	.	.	VNS (Garcia) [10]

Table 147: 20-D, running time excess ERT/ERT_{best} on f_{127} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

127 Griewank-Rosenbrock Cauchy												
$\frac{\Delta f_{target}}{ERT_{best}/D}$	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\frac{\Delta f_{target}}{ERT_{best}/D}$	
	0.05	0.05	0.05	0.05	0.05	79500	2.22e5	3.4e5	3.63e5	3.71e5		
ALPS	1	1	1.3	1400	<i>46e-2/2e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1.1	760	1.5e6	13	<i>83e-4/1e6</i>	.	.	.	AMaLGaM IDEA [4]	
avg NEWUOA	1	1	7.7	220	<i>43e-2/9e3</i>	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	1.1	1600	<i>42e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	140	<i>20e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	180	9e5	1	1	1	1	1	BIPOP-CMA-ES [14]	
(1+1)-CMA-ES	1	1	1	3e4	<i>81e-2/1e4</i>	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	1	7.5e7	<i>11e-1/3e5</i>	.	.	.	.	.	DASA [18]
DEPSO	1	1	1.1	950	<i>65e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	1.1	9.7e5	<i>73e-2/1e5</i>	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	1	1400	<i>44e-2/1e4</i>	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1.1	<i>15e-1/300</i>	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	1	560	3.3e6	19	67	44	41	40	iAMaLGaM IDEA [4]	
MA-LS-Chain	1	1	1.1	420	<i>43e-2/1e5</i>	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	1	1	1	<i>25e-3/4e3</i>	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	3.7	250	<i>45e-2/4e3</i>	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	1.3	2.8e4	<i>62e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1	1.2e6	<i>86e-2/1e5</i>	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	1.1	2.3e6	<i>99e-2/1e5</i>	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	1.3	5.2e5	<i>79e-2/1e6</i>	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	180	1.7e5	<i>83e-3/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	1.1	1700	<i>87e-2/300</i>	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	1	350	1.1e6	<i>45e-3/2e6</i>	.	.	.	.	VNS (Garcia) [10]

Table 148: 20-D, running time excess ERT/ERT_{best} on f_{128} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

128 Gallagher Gauss											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
	0.05	0.05	7020	6.69e5	8.61e5	8.61e5	8.61e5	8.62e5	8.62e5	8.62e5	
ALPS	1	1	240	5.3	4.3	<i>34e+0/2e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	16	1.2	1.1	1.1	1.1	1.1	1.1	1.1	AMaLGaM IDEA [4]
avg NEWUOA	1	1	<i>69e+0/9e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	<i>45e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	<i>75e+0/1e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	<i>66e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	<i>61e+0/3e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	<i>66e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	<i>73e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	<i>71e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	<i>69e+0/400</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	62	4.9	17	17	17	17	17	17	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	210	<i>30e+0/1e5</i>	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	<i>66e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	<i>70e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	<i>34e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	<i>67e+0/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	<i>72e+0/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	<i>24e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	21	<i>65e+0/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	<i>68e+0/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	2e3	<i>35e+0/1e6</i>	.	.	.	.	.	.	VNS (Garcia) [10]

Table 149: 20-D, running time excess ERT/ERT_{best} on f_{129} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
	0.05	0.05	3.91e5	2.07e6	2.08e6	2.08e6	2.09e6	2.1e6	2.1e6	2.12e6	
ALPS	1	1	<i>32e+0/2e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	18	7.1	<i>23e+0/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
avg NEWUOA	1	1	<i>74e+0/9e3</i>	.	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	<i>69e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	<i>76e+0/900</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	<i>70e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	<i>58e+0/3e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	<i>72e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	<i>70e+0/1e5</i>	.	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	<i>75e+0/1e4</i>	.	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	<i>68e+0/300</i>	.	.	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	<i>31e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	<i>27e+0/1e5</i>	.	.	.	.	.	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	<i>67e+0/4e3</i>	.	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	<i>73e+0/4e3</i>	.	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	<i>48e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	<i>67e+0/1e5</i>	.	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	<i>70e+0/1e5</i>	.	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	<i>24e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	<i>69e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	<i>67e+0/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	<i>56e+0/7e5</i>	.	.	.	.	.	.	.	VNS (Garcia) [10]

Table 150: 20-D, running time excess ERT/ERT_{best} on f_{130} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

130 Gallagher Cauchy											
$\Delta ftarget$ ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	$\Delta ftarget$ ERT_{best}/D
	0.05	0.05	245	4660	12600	12600	12700	12700	12800	12900	
ALPS	1	1	17	760	<i>21e-1/2e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	7.1	220	81	83	83	83	83	85	AMaLGaM IDEA [4]
avg NEWUOA	1	1	6.6	<i>45e-1/9e3</i>	.	.	.	.	.	.	avg NEWUOA [23]
BayEDAcG	1	1	10	<i>99e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	140	<i>75e+0/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1.9	33	14	14	14	14	14	14	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	2.5	<i>25e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	7500	<i>19e+0/3e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	6.3	6.3	<i>62e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
EDA-PSO	1	1	5700	<i>49e+0/1e5</i>	.	.	.	.	.	.	EDA-PSO [5]
full NEWUOA	1	1	19	<i>70e-1/1e4</i>	.	.	.	.	.	.	full NEWUOA [23]
GLOBAL	1	1	1	1	<i>72e-1/300</i>	.	.	.	.	.	GLOBAL [20]
iAMaLGaM IDEA	1	1	5.6	74	38	42	67	91	130	320	iAMaLGaM IDEA [4]
MA-LS-Chain	1	1	24	87	32	38	120	<i>21e-1/1e5</i>	.	.	MA-LS-Chain [19]
MCS (Neum)	1	1	37	<i>12e+0/4e3</i>	.	.	.	.	.	.	MCS (Neum) [16]
NEWUOA	1	1	9.1	<i>77e-1/4e3</i>	.	.	.	.	.	.	NEWUOA [23]
(1+1)-ES	1	1	4.2	200	<i>74e-2/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
PSO	1	1	1600	<i>17e+0/1e5</i>	.	.	.	.	.	.	PSO [6]
PSO_Bounds	1	1	5700	<i>50e+0/1e5</i>	.	.	.	.	.	.	PSO_Bounds [7]
Monte Carlo	1	1	<i>25e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	2	1.7	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]
SNOBFIT	1	1	<i>62e+0/300</i>	.	.	.	.	.	.	.	SNOBFIT [17]
VNS (Garcia)	1	1	69	78	48	48	48	48	48	47	VNS (Garcia) [10]

Table 151: 40-D, running time excess ERT/ERT_{best} on f_{101} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

101 Sphere moderate Gauss											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	13	29	37	41	45	48	52	55	68	ALPS [15]
AMaLgAM IDEA	1	25	37	40	39	38	36	37	37	35	AMaLgAM IDEA [4]
BayEDAcG	1	37	40	39	38	38	41	<i>25e-5/2e3</i>	.	.	BayEDAcG [9]
BFGS	1	<i>30e+1/2e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	1	1	1	1	1	1	1	(1+1)-CMA-ES [2]
DASA	1	4.4	5	5.7	6.4	7.2	7.7	7.9	8.2	8.5	DASA [18]
DEPSO	1	4.7	9.8	31	<i>17e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
iAMaLgAM IDEA	1	8.9	11	12	13	13	13	13	13	13	iAMaLgAM IDEA [4]
(1+1)-ES	1	2	2.6	2.3	2.3	2.8	3.4	4.4	4.7	13	(1+1)-ES [1]
Monte Carlo	1	<i>14e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.2	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	IPOP-SEP-CMA-ES [21]

Table 152: 40-D, running time excess ERT/ERT_{best} on f_{102} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

102 Sphere moderate unif											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	11	23	28	32	35	38	40	43	59	ALPS [15]
AMaLGaM IDEA	1	22	30	27	27	26	27	26	26	26	AMaLGaM IDEA [4]
BayEDAcG	1	30	29	28	28	28	28	<i>29e-5/2e3</i>	.	.	BayEDAcG [9]
BFGS	1	<i>29e+1/2e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.5	1.3	1.1	1	1.5	3.7	11	31	<i>19e-7/1e4</i>	(1+1)-CMA-ES [2]
DASA	1	5.3	14	16	100	1200	6.6e4	<i>42e-4/3e5</i>	.	.	DASA [18]
DEPSO	1	4	7.1	23	230	<i>16e-2/2e3</i>	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	6.4	8	8.7	9.1	9.2	9.6	9.6	9.7	9.7	iAMaLGaM IDEA [4]
(1+1)-ES	1	57	3900	4.4e5	<i>27e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	<i>13e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]

Table 153: 40-D, running time excess ERT/ERT_{best} on f_{103} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

103 Sphere moderate Cauchy											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	15	34	28	120	<i>41e-3/1e5</i>	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	24	47	30	26	24	22	36	68	130	AMaLGaM IDEA [4]
BayEDAcG	1	41	44	29	28	31	29	<i>33e-5/2e3</i>	.	.	BayEDAcG [9]
BFGS	1	73	48	29	21	17	13	12	10	8	BFGS [22]
BIPOP-CMA-ES	1	1.5	1.7	1.1	1.1	1.1	1.1	1.1	1.1	1.1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.3	1.1	1.1	5.3	1300	<i>13e-3/1e4</i>	.	.	.	(1+1)-CMA-ES [2]
DASA	1	4.2	6.1	5.1	260	<i>36e-3/3e5</i>	.	.	.	.	DASA [18]
DEPSO	1	5.2	12	62	<i>79e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	9.8	13	9.1	12	21	49	85	350	560	iAMaLGaM IDEA [4]
(1+1)-ES	1	1	1	1	6.5	2.3e4	<i>84e-4/1e6</i>	.	.	.	(1+1)-ES [1]
Monte Carlo	1	<i>14e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1.3	1.5	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]

Table 154: 40-D, running time excess ERT/ERT_{best} on f_{104} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

104 Rosenbrock moderate Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	18.6	243	77200	89900	91400	92200	92600	93000	93400	94100	ERT_{best}/D
ALPS	34	21	1	3.4	9.5	20	<i>14e-1/1e5</i>	.	.	.	ALPS [15]
AMaLGaM IDEA	23	3.3	4.1	3.7	3.7	3.7	3.7	3.7	3.7	3.7	AMaLGaM IDEA [4]
BayEDAcG	31	7.9	<i>63e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>50e+4/1e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.4	1	1.1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	<i>39e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	5.5	45	4.9	31	<i>74e-1/4e5</i>	.	.	.	.	.	DASA [18]
DEPSO	13	13	<i>96e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	9.4	1.3	18	20	23	28	28	27	27	27	iAMaLGaM IDEA [4]
(1+1)-ES	1.5	24	<i>45e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>93e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.3	5.3	<i>37e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 155: 40-D, running time excess ERT/ERT_{best} on f_{105} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

105 Rosenbrock moderate unif											
Δ_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δ_{target}
ERT_{best}/D	23.9	166	1.4e5	1.48e5	1.51e5	1.52e5	1.53e5	1.54e5	1.55e5	1.57e5	ERT_{best}/D
ALPS	25	36	1.4	3.6	<i>10e+0/1e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	21	5.3	<i>35e+0/1e6</i>	.	.	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	25	14	<i>81e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>46e+4/900</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.4	23	<i>72e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	6.9	2100	<i>96e+0/3e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	10	32	<i>10e+1/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	7.5	1.9	<i>35e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	20	4.4e4	<i>15e+1/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>99e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	9.2	<i>38e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 156: 40-D, running time excess ERT/ERT_{best} on f_{106} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

106 Rosenbrock moderate Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D											ERT_{best}/D
ALPS	36	60	38	160	<i>39e-1/1e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	26	18	<i>27e+0/1e6</i>	.	.	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	34	71	<i>10e+1/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>12e+3/4e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.6	1.6	1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.1	1	<i>28e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	5.8	22	14	200	<i>73e-2/7e5</i>	.	.	.	.	.	DASA [18]
DEPSO	15	95	<i>11e+1/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	10	6.5	<i>29e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1	2.2	8300	<i>13e+0/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>92e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.3	1.3	1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]

Table 157: 40-D, running time excess ERT/ERT_{best} on f_{107} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

107 Sphere Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.025	225	960	1440	1870	2170	2440	2720	3010	3620	ERT_{best}/D
ALPS	1	10	<i>35e+0/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.5	15	48	50	45	41	39	36	32	AMaLGaM IDEA [4]
BayEDAcG	1	2.7	<i>22e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	<i>29e+1/1e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.7	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	<i>22e+1/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	<i>20e+1/2e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	<i>19e+1/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1	130	110	140	170	150	140	130	110	iAMaLGaM IDEA [4]
(1+1)-ES	1	<i>17e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	<i>13e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	660	<i>17e+1/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 158: 40-D, running time excess ERT/ERT_{best} on f_{108} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

108 Sphere unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.025	2340	5370	14000	23400	37400	45900	52500	70400	1.06e5	ERT_{best}/D
ALPS	1	120	<i>11e+1/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	4.1	130	520	630	<i>46e-1/1e6</i>	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	1	<i>22e+1/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	<i>32e+1/800</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	<i>22e+1/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	<i>23e+1/2e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	<i>31e+1/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	20	270	520	<i>82e-1/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1	<i>18e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	<i>14e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	<i>29e+1/1e4</i>	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 159: 40-D, running time excess ERT/ERT_{best} on f_{109} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

109 Sphere Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.025	7.73	21	36.4	62.6	91.8	124	156	188	251	ERT_{best}/D
ALPS	1	12	1.4e4	<i>11e+0/1e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	16	16	16	15	46	130	140	150	150	AMaLGaM IDEA [4]
BayEDAcG	1	31	28	26	23	46	<i>10e-3/2e3</i>	.	.	.	BayEDAcG [9]
BFGS	1	<i>33e+1/2e3</i>	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1.1	1.1	1.1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	5.6	390	<i>87e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	240	<i>37e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	4.8	60	<i>62e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	7.4	9.7	27	87	230	490	430	410	350	iAMaLGaM IDEA [4]
(1+1)-ES	1	1.9	1600	<i>52e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	<i>13e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]

Table 160: 40-D, running time excess ERT/ERT_{best} on f_{110} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

110 Rosenbrock Gauss											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	160	<i>73e+1/1e5</i>	.	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	4.6	3.7	<i>38e+0/1e6</i>	.	.	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	4.5	<i>72e+1/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>52e+4/500</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	<i>37e+0/1e6</i>	.	.	.	.	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>24e+4/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>23e+4/2e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>35e+4/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	6	33	<i>39e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	<i>14e+4/1e6</i>	.	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>92e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	<i>40e+3/1e4</i>	.	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 161: 40-D, running time excess ERT/ERT_{best} on f_{111} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

111 Rosenbrock unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	2640	15500	nan	nan	nan	nan	nan	nan	nan	nan	ERT_{best}/D
ALPS	<i>30e+3/1e5</i>	.	.	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	6.2	18	<i>71e+0/1e6</i>	.	.	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	<i>21e+3/2e3</i>	.	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>46e+4/400</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	<i>38e+0/1e6</i>	.	.	.	.	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>27e+4/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>24e+4/2e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>44e+4/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	44	37	<i>59e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	<i>16e+4/1e6</i>	.	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>94e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	<i>49e+4/1e4</i>	.	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 162: 40-D, running time excess ERT/ERT_{best} on f_{112} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

112 Rosenbrock Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	18.4	72.3	4450	6350	6670	6800	6890	6960	7030	7160	ERT_{best}/D
ALPS	33	3900	<i>11e+1/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	27	12	<i>21e+0/1e6</i>	.	.	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	32	28	<i>89e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>51e+4/2e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.4	1	1.1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.2	35	<i>63e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	5	4e3	<i>97e+0/3e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	15	<i>24e+1/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	9.6	5.1	<i>28e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1	94	<i>51e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>89e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.2	2.2	1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]

Table 163: 40-D, running time excess ERT/ERT_{best} on f_{113} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

113 Step-ellipsoid Gauss											
Δt_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δt_{target}
ERT_{best}/D	51.8	1430	11000	63500	67400	75000	75000	75000	75000	75100	ERT_{best}/D
ALPS	2.1	140	<i>10e+1/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1.9	1.9	3.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	AMaLGaM IDEA [4]
BayEDAcG	4	<i>18e+1/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>19e+2/1e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	2	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	870	<i>11e+2/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	3200	<i>89e+1/2e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	120	<i>13e+2/2e3</i>	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	3.6	15	5.1	5.3	5.1	5.1	5.1	5.1	5.1	iAMaLGaM IDEA [4]
(1+1)-ES	1900	<i>72e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	24	<i>52e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	59	<i>51e+1/1e4</i>	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 164: 40-D, running time excess ERT/ERT_{best} on f_{114} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

114 Step-ellipsoid unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	165	7220	42000	1.64e5	2.51e5	2.88e5	2.88e5	2.88e5	2.88e5	2.92e5	ERT_{best}/D
ALPS	2.1	<i>50e+1/1e5</i>	.	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	9	62	<i>12e+0/1e6</i>	.	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	12	<i>94e+1/2e3</i>	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>19e+2/700</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	2.6	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	430	<i>13e+2/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	990	<i>99e+1/2e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>20e+2/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	10	29	360	<i>19e+0/1e6</i>	.	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1200	<i>74e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	11	<i>54e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	<i>19e+2/1e4</i>	.	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 165: 40-D, running time excess ERT/ERT_{best} on f_{115} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

115 Step-ellipsoid Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	4.15	26.7	514	4860	9320	10500	10500	10500	10500	10500	ERT_{best}/D
ALPS	8.9	16	<i>41e+0/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	11	12	1.1	1	1	1	1	1	1	1	AMaLGaM IDEA [4]
BayEDAcG	14	25	<i>25e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>17e+2/2e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.1	1.8	6.6	4.1	4	4	4	4	4	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1.2	470	<i>10e+1/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	7.1	<i>17e+1/2e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	3.8	24	<i>59e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	4.9	4.8	1	3.4	4.5	6	6	6	6	5.9	iAMaLGaM IDEA [4]
(1+1)-ES	2.2	2.6e5	<i>12e+1/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	420	<i>53e+1/1e6</i>	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.1	1	1.1	29	15	<i>31e-1/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 166: 40-D, running time excess ERT/ERT_{best} on f_{116} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

116 Ellipsoid Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	13100	60200	1.04e5	1.08e5	1.13e5	1.17e5	1.21e5	1.25e5	1.28e5	1.36e5	ERT_{best}/D
ALPS	<i>65e+2/1e5</i>	.	.	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.2	1	1	1	1	1	1	1	1	AMaLGaM IDEA [4]
BayEDAcG	<i>20e+3/2e3</i>	.	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>19e+4/500</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1.1	1	1	1.3	1.3	1.3	1.3	1.2	1.2	1.2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>93e+3/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>71e+3/2e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>14e+4/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	6.1	3.2	3.6	3.8	3.7	3.6	3.5	3.4	3.4	3.3	iAMaLGaM IDEA [4]
(1+1)-ES	<i>49e+3/1e6</i>	.	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>37e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	<i>52e+3/1e4</i>	.	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 167: 40-D, running time excess ERT/ERT_{best} on f_{117} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

117 Ellipsoid unif											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	31300	1.35e5	2.11e5	2.97e5	3.4e5	3.65e5	4.33e5	4.57e5	4.79e5	5.28e5	ERT_{best}/D
ALPS	<i>31e+3/1e5</i>	.	.	.	.	.	.	.	.	.	ALPS [15]
AMaLgAM IDEA	4.3	11	23	<i>90e+0/1e6</i>	.	.	.	.	.	.	AMaLgAM IDEA [4]
BayEDAcG	<i>58e+3/2e3</i>	.	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>16e+4/400</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	<i>12e+4/1e4</i>	.	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	<i>82e+3/2e5</i>	.	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>18e+4/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLgAM IDEA	14	15	71	<i>13e+1/1e6</i>	.	.	.	.	.	.	iAMaLgAM IDEA [4]
(1+1)-ES	<i>50e+3/1e6</i>	.	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>37e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	<i>14e+4/1e4</i>	.	.	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 168: 40-D, running time excess ERT/ERT_{best} on f_{118} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

118 Ellipsoid Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	139	363	980	1200	2050	2410	2720	2920	3110	3290	ERT_{best}/D
ALPS	35	<i>38e+1/1e5</i>	.	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	3.5	2.1	1	1	2	3.2	10	16	16	16	AMaLGaM IDEA [4]
BayEDAcG	<i>28e+2/2e3</i>	.	.	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	<i>16e+4/2e3</i>	.	.	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.2	1	1.4	1.1	1.1	1.2	1.2	1.3	1.4	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	7.7	<i>46e+1/1e4</i>	.	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1.9e4	<i>13e+2/4e5</i>	.	.	.	.	.	.	.	.	DASA [18]
DEPSO	<i>24e+2/2e3</i>	.	.	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1.6	1	1.8	6.5	7.3	18	23	26	24	23	iAMaLGaM IDEA [4]
(1+1)-ES	8500	<i>96e+1/1e6</i>	.	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	<i>38e+3/1e6</i>	.	.	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1.3	1.6	1.1	1.4	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]

Table 169: 40-D, running time excess ERT/ERT_{best} on f_{119} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

119 Sum of different powers Gauss											
Δ_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δ_{target}
ERT_{best}/D	0.025	1.28	1060	3080	3930	13300	53000	1.18e5	2.51e5	3.2e5	ERT_{best}/D
ALPS	1	1.8	50	<i>88e-1/1e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	4.8	17	24	8.8	3.9	2.2	1.2	1.3	AMaLGaM IDEA [4]
BayEDAcG	1.1	1.2	2.2	<i>93e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	670	<i>95e+0/1e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	7.7	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	180	<i>51e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	690	<i>43e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1.1	8.6	<i>35e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	2.7	5.5	57	84	27	7	3.2	1.5	1.5	iAMaLGaM IDEA [4]
(1+1)-ES	1.7	72	<i>36e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1.2	<i>28e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	4.1	4	<i>26e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 170: 40-D, running time excess ERT/ERT_{best} on f_{120} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

120 Sum of different powers unif											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	1	<i>23e+0/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	2.8	17	<i>30e-1/1e6</i>	.	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	1	1.2	<i>53e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	3.7	550	<i>82e+0/800</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	68	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	400	<i>61e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1200	<i>47e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	1300	<i>95e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	5.4	64	<i>48e-1/1e6</i>	.	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1	220	<i>39e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1.9	<i>29e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1500	<i>61e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 171: 40-D, running time excess ERT/ERT_{best} on f_{121} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

121 Sum of different powers Cauchy											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	1	1600	<i>84e-1/1e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLgAM IDEA	1	1.8	14	13	37	130	72	35	21	11	AMaLgAM IDEA [4]
BayEDAcG	1	2.3	33	35	<i>38e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1600	<i>92e+0/2e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1.8	1.1	1.1	1.1	1	1	1.3	1.6	2	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.9	2400	<i>14e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	35	<i>27e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1.1	3.4	28	<i>54e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
iAMaLgAM IDEA	1	1.5	8.3	28	100	310	130	100	110	65	iAMaLgAM IDEA [4]
(1+1)-ES	1	2.7	4.8e4	<i>95e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1.1	1.2	<i>28e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	2.2	1	1	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]

Table 172: 40-D, running time excess ERT/ERT_{best} on f_{122} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

122 Schaffer F7 Gauss											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	1	7.9	<i>58e-1/1e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.3	1.6	29	25	22	13	14	<i>11e-5/1e6</i>	.	AMaLGaM IDEA [4]
BayEDAcG	1	1	3.1	<i>59e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	37	<i>18e+0/1e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	4.3	1.8	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1.8	1200	<i>13e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	11	<i>12e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.1	53	<i>12e+0/2e3</i>	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1	1	51	60	39	15	13	50	<i>49e-6/1e6</i>	iAMaLGaM IDEA [4]
(1+1)-ES	1	60	1.5e4	<i>10e+0/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1.2	1200	<i>88e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	110	<i>99e-1/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 173: 40-D, running time excess ERT/ERT_{best} on f_{123} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

123 Schaffer F7 unif											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	1.5	20	<i>82e-1/1e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLgAM IDEA	1	1.3	1	<i>43e-1/1e6</i>	.	.	.	.	.	.	AMaLgAM IDEA [4]
BayEDAcG	1	1.1	<i>13e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	28	<i>18e+0/900</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	2.2	3.3	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	430	<i>14e+0/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	9.9	<i>12e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.1	<i>20e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLgAM IDEA	1	1.1	11	<i>46e-1/1e6</i>	.	.	.	.	.	.	iAMaLgAM IDEA [4]
(1+1)-ES	1	34	1.4e4	<i>11e+0/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1.2	470	<i>88e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	<i>13e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 174: 40-D, running time excess ERT/ERT_{best} on f_{124} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

124 Schaffer F7 Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.025	0.025	14.3	754	5310	6580	9160	20500	28600	56000	ERT_{best}/D
ALPS	1	1.2	13	<i>59e-1/1e5</i>	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1.1	9.9	1.4	5.4	4.6	3.5	1.6	1.3	1	AMaLGaM IDEA [4]
BayEDAcG	1	1.1	20	5.2	<i>11e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	180	<i>17e+0/2e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	4.1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	500	<i>95e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1.3	1.6e5	<i>11e+0/2e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1.3	8.2	<i>58e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1.3	4.6	3.5	16	27	19	8.8	6.4	3.3	iAMaLGaM IDEA [4]
(1+1)-ES	1	4.2	4600	<i>84e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1.4	1.2e4	<i>89e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	3.1	1	3.2	1.4	1.5	2.5	<i>16e-4/1e4</i>	.	.	IPOP-SEP-CMA-ES [21]

Table 175: 40-D, running time excess ERT/ERT_{best} on f_{125} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

125 Griewank-Rosenbrock Gauss											
Δt_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δt_{target} ERT_{best}/D
ALPS	1	1	1.2	1.8	<i>64e-2/1e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1	1.4	<i>44e-2/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	1	1	1.1	2	<i>69e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	1	<i>28e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1.8	1	1	1	<i>41e-2/7e5</i>	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	<i>15e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	7.1	<i>20e-1/2e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	1	240	<i>12e-1/2e3</i>	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1	1	1	<i>44e-2/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1	1	3.5	<i>15e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1	1	<i>14e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	1300	<i>11e-1/1e4</i>	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 176: 40-D, running time excess ERT/ERT_{best} on f_{126} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

126 Griewank-Rosenbrock unif											
Δ_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δ_{target} ERT_{best}/D
ALPS	1	1	1.1	10	<i>81e-2/1e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1.1	1	<i>50e-2/1e6</i>	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	1	1	1.1	<i>12e-1/2e3</i>	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	28	<i>29e-1/1e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	2.8	<i>50e-2/4e5</i>	.	.	.	.	.	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	<i>16e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	1	<i>20e-1/2e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	1.1	<i>23e-1/2e3</i>	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1	1	4.3	<i>51e-2/1e6</i>	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1	1	1	<i>16e-1/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1	1.1	<i>14e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	<i>17e-1/1e4</i>	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 177: 40-D, running time excess ERT/ERT_{best} on f_{127} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

127 Griewank-Rosenbrock Cauchy											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.025	0.025	0.025	17.6	44700	2.63e5	3.78e5	6.24e5	6.49e5	6.66e5	ERT_{best}/D
ALPS	1	1	1.1	7.1	<i>70e-2/1e5</i>	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	1	7	2.3	56	<i>19e-3/1e6</i>	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	1	1	1.2	13	<i>59e-2/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	300	<i>28e-1/2e3</i>	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	2.4	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	1	<i>13e-1/1e4</i>	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	1	<i>20e-1/2e5</i>	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	1	53	<i>95e-2/2e3</i>	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1	1.2	4	3.5	8.7	<i>11e-3/1e6</i>	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1	1	1	8.4e5	<i>11e-1/1e6</i>	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1	1.1	<i>15e-1/1e6</i>	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	1.1	1	<i>16e-2/1e4</i>	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 178: 40-D, running time excess ERT/ERT_{best} on f_{128} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

128 Gallagher Gauss											
Δf_{target}	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target}
ERT_{best}/D	0.025	0.025	1.03e5	9.57e5	2.82e6	2.82e6	2.82e6	2.82e6	2.82e6	2.82e6	ERT_{best}/D
ALPS	1	1	<i>70e+0/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	10	3.4	2.4	2.4	2.4	2.4	2.4	2.4	AMaLGaM IDEA [4]
BayEDAcG	1	1	<i>73e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	<i>84e+0/1e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	<i>81e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	<i>79e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	<i>80e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1	32	4.8	2.5	2.5	2.5	2.5	2.5	2.5	iAMaLGaM IDEA [4]
(1+1)-ES	1	1	<i>74e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1	<i>68e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	<i>82e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 179: 40-D, running time excess ERT/ERT_{best} on f_{129} , in *italics* is given the median final function value and the median number of function evaluations to reach this value divided by dimension

129 Gallagher unif											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	1	<i>70e+0/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	<i>66e+0/1e6</i>	.	.	.	.	.	.	.	AMaLGaM IDEA [4]
BayEDAcG	1	1	<i>81e+0/2e3</i>	.	.	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	<i>84e+0/800</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	1	1	1	1	1	1	1	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	<i>80e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	<i>79e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	<i>84e+0/2e3</i>	.	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1	<i>66e+0/1e6</i>	.	.	.	.	.	.	.	iAMaLGaM IDEA [4]
(1+1)-ES	1	1	<i>74e+0/1e6</i>	.	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1	<i>68e+0/1e6</i>	.	.	.	.	.	.	.	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	<i>84e+0/1e4</i>	.	.	.	.	.	.	.	IPOP-SEP-CMA-ES [21]

Table 180: 40-D, running time excess ERT/ERT_{best} on f_{130} , in italics is given the median final function value and the median number of function evaluations to reach this value divided by dimension

130 Gallagher Cauchy											
Δf_{target} ERT_{best}/D	1e+03	1e+02	1e+01	1e+00	1e-01	1e-02	1e-03	1e-04	1e-05	1e-07	Δf_{target} ERT_{best}/D
ALPS	1	1	<i>42e+0/1e5</i>	.	.	.	.	.	.	.	ALPS [15]
AMaLGaM IDEA	1	1	7.5	100	95	95	95	95	95	95	AMaLGaM IDEA [4]
BayEDAcG	1	1	3.8	1	<i>17e-1/2e3</i>	.	.	.	.	.	BayEDAcG [9]
BFGS	1	1	<i>83e+0/2e3</i>	.	.	.	.	.	.	.	BFGS [22]
BIPOP-CMA-ES	1	1	1	24	7.9	7.9	7.9	7.9	7.9	7.9	BIPOP-CMA-ES [14]
(1+1)-CMA-ES	1	1	<i>47e+0/1e4</i>	.	.	.	.	.	.	.	(1+1)-CMA-ES [2]
DASA	1	1	<i>75e+0/2e5</i>	.	.	.	.	.	.	.	DASA [18]
DEPSO	1	1	12	<i>20e+0/2e3</i>	.	.	.	.	.	.	DEPSO [11]
iAMaLGaM IDEA	1	1	3.4	66	40	50	68	70	97	97	iAMaLGaM IDEA [4]
(1+1)-ES	1	1	2.2e4	<i>20e+0/1e6</i>	.	.	.	.	.	.	(1+1)-ES [1]
Monte Carlo	1	1	<i>68e+0/1e6</i>	Monte Carlo [3]
IPOP-SEP-CMA-ES	1	1	1	1.6	1	1	1	1	1	1	IPOP-SEP-CMA-ES [21]

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