



**HAL**  
open science

## Spatial analysis of extreme rainfalls in the Cévennes-Vivarais region

Caroline Bernard-Michel, Laurent Gardes, Stéphane Girard, Gilles Molinié

► **To cite this version:**

Caroline Bernard-Michel, Laurent Gardes, Stéphane Girard, Gilles Molinié. Spatial analysis of extreme rainfalls in the Cévennes-Vivarais region. SETA 2009 - Spatial Extremes, Theory and Applications, Apr 2009, Lisbonne, Portugal. pp.CDROM, 2009. hal-00762719

**HAL Id: hal-00762719**

**<https://inria.hal.science/hal-00762719v1>**

Submitted on 12 May 2014

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# Spatial analysis of extreme rainfalls in the Cévennes-Vivarais region

C. Bernard-Michel<sup>(1)</sup>, L. Gardes<sup>(1)</sup>, S. Girard<sup>(1)</sup> & G. Molinié<sup>(2)</sup>

<sup>(1)</sup>team MISTIS, INRIA Rhône-Alpes & Laboratoire Jean Kuntzmann

{Caroline.Bernard-Michel, Laurent.Gardes, Stephane.Girard}@inrialpes.fr

<sup>(2)</sup> Laboratoire d'étude des Transferts en Hydrologie et Environnement

Gilles.Molinie@hmg.inpg.fr

**Abstract:** This study takes place in the MedUP project, founded by the "Agence Nationale de la Recherche" (French Research Agency) through its VMC program ("Vulnérabilité, Milieux, Climats "). MedUP deals with the quantification and identification of sources of uncertainties associated with the forecast and climate projection for Mediterranean high-impact weather events. Here, we focus on the estimation of return periods and return levels of extreme rainfalls in the Cévennes-Vivarais region. The hourly data were collected from 142 raingauges located in this region between 1993 and 2000. A first analysis revealed that, the excess rainfall distribution depends on the raingauges location. We propose to model the excess rainfall distribution by a Generalized Pareto Distribution with positive shape parameter depending on geographical covariates. This so-called "conditional tail-index" is then estimated with a nearest neighbour approach. This permits to derive return period maps on the region of interest.