

HIGH ORDER SCALABLE HDG METHOD FOR FREQUENCY-DOMAIN ELECTROMAGNETICS

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Discontinuous Galerkin (DG) methods have been extensively studied in the last ten years for the numerical solution of the time-domain Maxwell equations. For the numerical treatment of the frequency-domain Maxwell equations, nodal DG methods can also be considered. However, such DG formulations are highly expensive, especially for the discretization of 3d problems, because they lead to a large sparse and indefinite linear system of equations coupling all the degrees of freedom of the unknown physical fields. Different attempts have been made in the recent past to improve the efficiency of DG methods applied to steady-like problems and one promising strategy has been proposed by Cockburn *et al.* [1] in the form of so-called hybridizable DG formulations. Such HDG methods have then been designed for the system of frequency-domain Maxwell equations [2]-[3]. In this talk, we will report on recent further developments of the HDG method proposed in [3] aiming at improving its accuracy and scalability for large-scale 3d problems. Beside extending the implementation to an arbitrary high and locally defined interpolation order, an algebraic hybrid iterative-direct solution strategy [4] is considered for the hybrid system characterizing the proposed HDG formulation.

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