

IPDG and HDG Methods for the Helmholtz Equation

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In this talk we discuss the interior penalty discontinuous Galerkin (IPDG) method and hybridizable discontinuous Galerkin (HDG) method for the Helmholtz equation with first order absorbing boundary condition in two and three dimensions. We prove that both methods are stable (hence well-posed) without any mesh constraint. Moreover, for the HDG method, the stability constant is independent of the polynomial degree. We also derive the error estimates for both methods in the L_2 norm for piecewise polynomial spaces. We will compare the stability and convergence properties of two proposed methods in the case where wave number is large. This is joint work with Wujun Zhang from University of Maryland.