Luke Olson On Solving High-Order Discontinuous Galerkin Discretizations of Maxwell's Equation

Division of Applied Mathematics
Brown University
Box F
182 George Street
Providence
RI 02912
lolson@dam.brown.edu

One problematic aspect of using high-order discretizations is the often delicate issue of solving the resulting system of equations in an iterative context. We consider the time-harmonic Maxwell's Equation. High-order spectral elements are used in a Discontinuous Galerkin (DG) setting resulting in a possibly indefinite system of equations. We utilize the symmetry in the method and study several preconditioning schemes in a Krylov subspace setting. We propose strategies to effectively handle this problem and offer preliminary numerical results in support.