1067-65-1016   **Andrew T. Barker*** (`andrewb@math.lsu.edu`), Department of Mathematics, Lousiana State University, Baton Rouge, LA 70803-4918, and **Susanne C. Brenner** and **Li-Yeng Sung**.
Additive Schwarz preconditioners for the local discontinuous Galerkin method.

The local discontinuous Galerkin method is an attractive discretization because it allows for easy local mesh refinement and adaptivity and satisfies optimal error estimates, but does not require the tuning of a penalty parameter. We develop and analyze two level additive Schwarz preconditioners for the LDG discretization, considering different coarse spaces and intergrid transfer operators, and show that the condition number of the preconditioned operator is bounded independent of the number of subdomains and the discretization size. Finally, we present numerical results illustrating the real-world performance and parallel scalability of the method. (Received September 17, 2010)