1077-65-1579 **Andrew T. Barker*** (andrewb@math.lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803-4918, and **Susanne C. Brenner** and **Li-Yeng Sung**. *Domain decomposition preconditioners for the discontinuous Petrov-Galerkin method.* Preliminary report.

The discontinuous Petrov-Galerkin method allows for use of nearly optimal test functions at a reasonable computational cost, because the test functions can be solved for locally. The resulting methods can be very effective and show good stability properties, but solution of the resulting ill-conditioned linear systems is a challenge. We explore the effectiveness of domain decomposition preconditioning for linear systems arising from the DPG discretization, considering both their theoretical properties and their practical efficiency on parallel computers. (Received September 20, 2011)