1079-65-263 **Francisco-Javier Sayas*** (fjsayas@math.udel.edu), Department of Mathematical Sciences, University of Delaware, Newark, DE 19716, and **Norbert Heuer**. *Non-symmetric coupling of Interior Penalty and Boundary Element Methods.*

Boundary Element Methods can be advantageously used to deal with unbounded regions in simulations where the main computational load is given to a classical PDE solver, such as the Finite Element Method. In comparison with other strategies to design absorbing boundary conditions (such as PML and Differential ABC), Boundary Integral Equations offer great geometric flexibility and exactness in the way they deal with the associated radiation condition at infinity. In this work we present a non-symmetric coupling of Boundary Elements with three variants of the Interior Penalty Discontinuous Galerkin method for diffusion problems. Until very recently, the analysis of the coupling of BEM with DG was restricted to symmetric coupling methods, that use two integral equations as a way of enforcing symmetry and relying on energy arguments for stability. However, there was numerical evidence of the good performance of the most simple-minded coupling methods, that use a single boundary integral equation to create the non-local absorbing boundary condition but pay the price of losing with the symmetry in the formulation. We show how some recently discovered tools in the analysis of BEM-FEM can be recycled -together with finely tuned rigid scaling arguments- to prove convergece of these methods. (Received January 16, 2012)