1067-65-827 **Huiqing Zhu*** (Huiqing.Zhu@usm.edu), 118 College Drive, #5045, Hattiesburg, MS 39401, and **Zhimin Zhang** (zzhang@math.wayne.edu), 656 W. Kirby, FAB 1131, Detroit, MI 48202. *Local Error Estimates of the LDG Method for One-Dimensional Singularly Perturbed Convection-diffusion Equations.*

The local discontinuous Galerkin method (LDG) is applied to one-dimensional singularly perturbed convection-diffusion equations, which exhibit a boundary layer near the outflow boundary. Local error estimates are established on quasi-uniform meshes with maximum mesh size $h$. On a subdomain with $O(h \ln(1/h))$ distance away from the outflow boundary, the $L^2$ errors of the LDG approximations to the solution and its derivative converge at an optimal rate, which is also uniformly valid in terms of the singularly perturbed parameter. The numerical experiments illustrate that the rate of convergence is sharp. Comparison studies are made between the LDG method and the streamline-diffusion finite element method. (Received September 15, 2010)