1046-65-353 **Zhimin Zhang**, 656 W. Kirby, #1131, Detroit, MI 48202, and **Huiqing Zhu*** (at7136@wayne.edu), 656 W. Kirby, #1118, Detroit, MI 48202. *Convergence Analysis of Mixed LDG Methods applied to 2-D singularly perturbed problems.*

The mixed scheme of local discontinuous Galerkin methods on 2-dimensional domain is analyzed for solving singularly convection-diffusion problems. Two types of numerical fluxes are chosen for the LDG scheme. An convergence rate in compact energy norm, which involves both the error of the gradient and the potential, is established under certain regularity assumptions. This convergence rate is $O(N^{-1.5})$ with respect to a certain ϵ, where $N \times N$ is the number of elements in each subdomains. Furthermore, under one more assumption about the numerical fluxes, an ϵ-uniform convergence rate $O((\ln \epsilon/N)^2)$ is verified. Numerical experiments verified the convergence behaviors. (Received August 27, 2008)