1046-65-1060 **Yingda Cheng*** (ycheng@math.utexas.edu), Department of Mathematics, University of Texas at Austin, Austin, TX 78712, and **Chi-Wang Shu**, Division of Applied Mathematics, Brown University, Providence, RI 02912. *Superconvergence of Discontinuous Galerkin Finite Element Solutions for Time-Dependent Problems.*

In this talk, we present the convergence study of the discontinuous Galerkin (DG) finite element solution for conservation laws when special fluxes are used. We prove that the DG solution will be superconvergent towards a particular projection of the exact solution with order $(k + 1.5)$ when piecewise P^k polynomials are used, if $k \geq 1$. This is a sharp estimate as shown by numerical experiments. We will also discuss the superconvergence of the local DG (LDG) method for convection-diffusion equations. (Received September 14, 2008)