1057-65-146   **Yulong Xing*** (`xingy@math.utk.edu`), Department of Mathematics, Univeristy of Tennessee, 1534 Cumberland Avenue, knoxville, TN 37996. *Positive preserving high order well balanced discontinuous Galerkin methods for the shallow water equations.*

Shallow water equations with a non-flat bottom topography have been widely used to model flows in rivers and coastal areas. They have steady state solutions in which the flux gradients are nonzero but exactly balanced by the source term. In this presentation we propose a recently developed high order discontinuous Galerkin (DG) method which can preserve the steady state exactly, and at the same time is positivity preserving. A rigorous proof will show that this DG method keeps the water height non-negative, without destroying the mass-conservation. Some numerical tests are performed to verify the positivity, well balanced property, high order accuracy, and good resolution for smooth and discontinuous solutions. (Received January 19, 2010)