1067-65-403 **Xiangxiong Zhang*** (zhangxx@dam.brown.edu). *Maximum-principle-satisfying and positivity-preserving high order discontinuous Galerkin and finite volume schemes for conservation laws.*

We construct uniformly high order accurate discontinuous Galerkin (DG) and finite volume (FV) schemes satisfying a strict maximum principle for scalar conservation laws and passive convection in incompressible flows, and positivity preserving for density and pressure for compressible Euler equations. A general framework (for arbitrary order of accuracy) is established to construct a limiter for the DG or FV method with first order Euler forward time discretization solving one dimensional scalar conservation laws. Strong stability preserving (SSP) high order time discretizations will keep the maximum principle and make the scheme uniformly high order in space and time. It is straightforward to extend the method to two and higher dimensions. The same limiter can be shown to preserve the maximum principle for the DG or FV scheme solving two-dimensional incompressible Euler equations in the vorticity stream-function formulation, or any passive convection equation with an incompressible velocity field. A suitable generalization results in a high order DG or FV scheme satisfying positivity preserving property for density and pressure for compressible Euler equations and positivity preserving for water height for shallow water equations. Numerical tests will be shown. (Received September 01, 2010)