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Zhiliang Xu* (zxu2@nd.edu). *Central and Central Discontinuous Galerkin (DG) Schemes on Overlapping Cells of Unstructured Grids for Solving Ideal MHD Equations with Globally Divergence-Free Magnetic Field.*

In this talk, I will present new central and central DG schemes for solving ideal magnetohydrodynamic (MHD) equations while preserving globally divergence-free magnetic field on triangular grids. These schemes incorporate the constrained transport (CT) scheme of Evans and Hawley with central schemes and central DG methods on overlapping cells which have no need for solving Riemann problems across cell edges where there are discontinuities of the numerical solution. The schemes are formally second-order accurate with major development on the reconstruction of globally divergence-free magnetic field on polygonal dual mesh. Moreover, the computational cost is reduced by solving the complete set of governing equations on the primal grid while only solving the magnetic induction equation on the polygonal dual mesh. (Received September 24, 2018)