1016-35-51          **Nicolae Tarfulea*** (`tarfulea@calumet.purdue.edu`), Department of Mathematics, Purdue University Calumet, 2200 169th Street, Hammond, IN 46323. *Geometric Boundary Conditions for a Constrained First Order Hyperbolic System of Differential Equations.* Preliminary report.

We consider a first order symmetric hyperbolic system subject to certain constraints and provide well-posed boundary conditions consistent with the constraints, i.e., with these boundary conditions, if the constraints are satisfied at the initial time, then the solution of the evolution system satisfies them for all time. We analyze the existence of well-posed constraint preserving boundary conditions for both polyhedral and regular domains with the result that there exists a set of such boundary conditions. Moreover, for a curved boundary domain, these boundary conditions involve the geometry of the boundary. By using discontinuous Galerkin techniques, we provide numerical evidence that the constraints are indeed preserved through evolution if constraint-preserving boundary conditions are used, in contrast with what happens for some other boundary conditions. This is a joint work with Douglas N. Arnold and Jing Wang. (Received January 22, 2006)