5007-76-63 **Pablo Ulises Suarez*** (psuarez@desu.edu), 1200 N Dupont Hwy, Dover, DE 19709. *A Numerical Study of the axisymmetric Taylor-Couette Problem using the Galerkin Characteristics Method.* Preliminary report.

The Taylor–Couette problem consists of a viscous fluid confined in a gap between two concentric rotating cylinders. When the angular velocity of the inner cylinder is increased above a certain threshold, the flow becomes unstable and a secondary steady state characterized by axisymmetric toroidal vortices emerge. The governing equations are the axisymmetric Navier Stokes equations. A Galerkin Characteristics Method is used to solve these equations and reproduce the vortices. To advance in time we discretize the convective term using the Method of Characteristics. To discretize in space we use a Galerkin Method with Taylor-Hood elements. The method can be implemented in a straightforward by using *FreeFEM++*. The numerical results agree accurately with linear stability theory and with previous numerical studies. (Received April 18, 2013)