1106-35-1966 **Brian W Bell*** (bwbell@asu.edu) and **Mohamed Moustaoui** (mohamed.moustaoui@asu.edu).
A Split Explicit Scheme for Integration of Nonlinear Atmospheric Equations Involving Multiple Timescales.

This talk will introduce and discuss a new numerical scheme developed to be well suited to solve nonlinear partial differential equations like those which compose global spectral and weather prediction models. The scheme enhances the computationally inexpensive leapfrog scheme by incorporating a high order implicit filter that maintains third order amplitude accuracy while damping unphysical computational modes which are inherent in leapfrog. The scheme is split explicit using two time steps. Slow waves are treated by time filtered leapfrog, while fast waves are treated by a semi-implicit scheme. For each time step, the scheme uses one evaluation compared with three evaluations required by the third-order Runge-Kutta method, a primary shceme currently used in some national weather prediction models. The new scheme is developed and implemented to solve global shallow-water equations on a sphere using spectral methods and to solve Navier Stokes equations. The performance is demonstrated by comparing the results for this scheme with those from third order Runge-Kutta. (Received September 15, 2014)