1096-76-1997 **Lee M. Burke*** (lmburke2@asu.edu), 2 W. Erie Dr., Tempe, AZ 85282, and **Lauren R. Johnson**, **Chris Barton** and **Mohamed Moustaoui**. *A new numerical scheme based on the leapfrog method for atmospheric and ocean modeling.*

A semi-implicit, fourth-order time-filtered leapfrog numerical scheme is presented and applied to the global shallow water spectral model to simulate the nonlinear evolution of twin tropical cyclones. This is a challenging model problem to illustrate the efficacy of a novel time-filter for the leapfrog scheme. The leapfrog scheme leads to computational modes in the solutions to highly nonlinear systems, and time-filters are often used to damp these modes. The proposed filter damps the computational modes without degrading the physical mode. This scheme is third-order accurate in amplitude and has a larger zone of stability compared to the standard Robert-Asselin filtered leapfrog scheme, which is first-order accurate. This talk presents the new time-stepping scheme, demonstrates its ability to suppress the computational modes, and shows its applicability and implementation in a global spectral atmospheric model. (Received September 17, 2013)