1106-65-1965 **Dalton M Woodard*** (daltonmwoodard@gmail.com) and **Mohamed Moustaoui** (mohamed.moustaoui@asu.edu). *Stability and Accuracy Analysis of a Split-Explicit Scheme based on a Fourth-Order Time-Filtered Leapfrog Method.*

In this talk we analyze the behavior of a new split-explicit numerical scheme combining a semi-implicit scheme with a fourth-order time-filtered Leapfrog method. This new scheme is aimed at numerically stable, accurate, simple, yet efficient numerical integration of certain classes of partial differential equations appearing often in atmospheric, ocean, and climate modeling. In particular our attention will be focused on the ability of this new scheme to accurately resolve physical solutions, while successfully damping unphysical modes. We present an accuracy and stability analysis, noting briefly at first what we mean by numerical stability of schemes. We then offer a comparison in stability between this new scheme, other Leapfrog schemes, and the widely used third-order Runge-Kutta method, making special note of the similarities and, moreover, the computational efficiencies gained over the latter. In conclusion, we consider a solution generated by this new scheme to a common test case of nonlinear atmospheric models, and note its consistency with the canonical solution as an empirical verification of stability. (Received September 15, 2014)