1086-00-1929 **Eric Van Buren*** (eric.vanburen@asu.edu), **James Upton** (jtupton@asu.edu), **Scott Van Buren** (scott.vanburen@asu.edu) and **Mohamed Moustaoui** (mohamed.moustaoui@asu.edu).

A New High-Order Filter for Leapfrog Time Integration of Wave Problems.

Asselin-filtered leapfrog time integration is the standard numerical scheme used in climate and atmospheric modeling due to its favorable computational efficiency, stability, and ability to reduce leapfrog's non-physical computational modes. However, the Asselin filter has a key disadvantage–significant damping of the physical computational modes which results in numerical degradation of the solution. We present a high-order filter that is superior to and more robust than the Asselin filter. In particular, the high-order filter increases the accuracy of the solution to third order in amplitude and decreases the damping of the physical computational modes, while still damping the non-physical computational modes. This talk will provide both a theoretical background and numerical analysis of the high-order filter, and an example comparing the high-order filter to a Runge-Kutta scheme. (Received September 24, 2012)