1038-65-28 **Haseena Ahmed**, Department of Mathematics, Iowa State University, Ames, IA 50011, and **Hailiang Liu*** (hliu@iastate.edu), Department of mathematics, Iowa State University, Ames, IA 50011. *Alternating evolution methods for hyperbolic conservation laws.*

Based on the alternating evolution approximation we develop a class of local Alternating Evolution (AE) schemes, where we take advantage of high accuracy of the AE approximation. Our approach is based on a sliding average of the AE system over an interval of $[x - \Delta x, x + \Delta x]$. The numerical scheme is then constructed by sampling the averaged system over alternating grids. Higher order accuracy is achieved by a combination of high-order polynomial reconstruction from the obtained averages and a stable Runge-Kutta discretization in time. Local AE schemes are made possible by letting the scale parameter ϵ reflect the local distribution of nonlinear waves. The AE schemes have the advantage of easier formulation and implementation, and efficient computation of the solution. For the first and second order local AE schemes applied to scalar laws, we prove the numerical stability in the sense of satisfying the maximum principle and total variation diminishing (TVD) property. Numerical tests for both scalar conservation laws and compressible Euler equations are presented to demonstrate the high order accuracy and capacity of these AE schemes. (Received December 21, 2007)