1077-65-1385 **Debojyoti Ghosh*** (ghosh@umd.edu), Department of Mathematics, University of Maryland, College Park, MD 20740, and **James D. Baeder** (baeder@umd.edu), Department of Aerospace Engineering, University of Maryland, College Park, MD 20740. *High Order Compact Reconstruction Scheme with Weighted Essentially Non-Oscillatory Limiting.*

Hyperbolic partial differential equations admit discontinuous solutions and high order accurate numerical schemes need limiters to avoid spurious oscillations across discontinuities. The Weighted Essentially Non-Oscillatory (WENO) scheme uses adaptive stenciling to achieve high order accuracy in smooth regions of the flow and yield non-oscillatory interpolation across discontinuities. A new compact-reconstruction WENO scheme is proposed where candidate interpolations are implicit resulting in compact stencils. The new scheme is expected to be non-oscillatory as well as have better spectral resolution as expected from compact interpolation. The new scheme is applied to the advection equation and the inviscid Burgers equation. The errors and orders of convergence are measured for smooth problems. Discontinuous solutions are used to analyze the non-oscillatory nature of the new scheme. It is observed that the new scheme shows significantly lower error than the traditional WENO scheme of the same order. The new scheme results in less smearing for discontinuities and extrema are captured with higher resolution since compact schemes have lower dissipation and dispersion errors. The scheme is also applied to the Euler equations of fluid dynamics and similar observations are made. (Received September 19, 2011)