Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

A minimally diffusive interface function steepening approach for compressible multiphase flows JONATHAN REGELE, Iowa State University — Interface capturing methods for contacts and shocks are commonly used in compressible multiphase flows. Artificial diffusion is inherently necessary to stabilize jump discontinuities across shocks and contacts. Contacts suffer from diffusion more severely than shock waves because their characteristics are not convergent like shocks. Interface steepening procedures are commonly used to counteract numerical diffusion necessary to maintain a sharp interface function. In this work, a modification to the sharpening approach used in Shukla, Pantano, and Freund [J. Comp. Phys, 229, 2010] is developed that minimizes the artificial diffusion across the interface while maintaining a monotonic interface function. The method requires fewer iterations for convergence and provides a steeper interface function. Examples in one and two dimensions demonstrate the method's performance.

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Date submitted: 28 Jul 2015 Electronic form version 1.4