

Abstract Submitted  
for the DPP08 Meeting of  
The American Physical Society

**Verification and Validation of the VULCAN Lagrange-ALE HEDP Code** J.M. REYNOLDS, J.H. COOLEY, T.O. MASSER, J.G. WOHLBIER, B.D. LANSRUD-LOPEZ, R.B. LOWRIE, M. KENAMOND, J. WALTZ, Los Alamos National Laboratory — We present a V and V study of the VULCAN 3T physics and grey radiation diffusion packages in regimes relevant to HEDP. Cases where the material penetration of the radiation front is either supersonic or subsonic are considered. Computations of the Marshak thermal diffusion problem are verified against analytical solutions. Simulations that model supersonic radiation transport in heated foam cylinders are validated against published results [1]. Radiation-driven planar shock wave simulations are compared to semi-analytical solutions [2]. Simulations of an Omega experiment where a shock is driven through a Be disk are verified against the time history of the front position, the mean shock velocity, and the breakout time. Comparisons of our calculations are made to computations from the cassio Eulerian-AMR code. LA-UR-08-04737. [1] C.A. Back, et al., Physics of Plasmas, 7, 2126 (2000). [2] R. Lowrie and J.D. Edwards, Shock Waves, 18, 129 (2008).

James Cooley  
Los Alamos National Laboratory

Date submitted: 21 Jul 2008

Electronic form version 1.4