Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

Approximation of multifluid mixture response for simulation of sharp and diffuse material interfaces on an Eulerian grid ILYA LOMOV, BEN LIU, LLNL — Multimaterial Eulerian and Arbitrary Lagragian-Eulerian (ALE) codes usually use volume fractions of materials to track individual components in mixed cells. Material advection usually is calculated by either interface capturing, when the high-order van Leer –like slope reconstruction technique is applied or interface tracking, when the normal reconstruction technique is applied. The former approach is more appropriate for gas-like substances, the latter is ideal for solids and liquids, since it does not smear out material interface. Wide range of problems involves both diffuse and sharp interfaces between substances and demand for combination of these techniques. It is possible to treat all substances which can diffuse into each other as a single material and only keep mass fractions of the individual components of the mixture. The material response can be determined based on the assumption of pressure and temperature equilibrium between components of the mixture. Unfortunately, it is extremely difficult to solve the corresponding system of equations. In order to avoid these problems one can introduce effective gamma and employ ideal gas approximation to calculate mixture response. The method provides reliable results, is able to compute strong shock waves, and deals with complex equations of state. Results from a number of simulations using this scheme will be presented

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Date submitted: 11 Apr 2005 Electronic form version 1.4