Abstract Submitted
for the SHOCK15 Meeting of
The American Physical Society

Insights from Exploring Thermodynamics-Based Artificial Viscosity ANN E. MATTSSON, Sandia National Laboratories — Artificial viscosity is a crucial method for handling shock waves numerically in continuum codes. It serves to smoothen the naturally abrupt shock front over several numerical cells, thus enhancing numerical stability of the calculation. I have re-derived, in general terms, the requirements on, and limitations of, the artificial viscosity to produce a stable smoothened shock front and will share insights from this work. In particular, I will discuss which thermodynamic quantities will be needed in an implementation based on this new artificial viscosity concept. Sandia National Laboratories is a multiprogram laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Ann E. Mattsson
Sandia National Laboratories

Date submitted: 28 Jan 2015 Electronic form version 1.4