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Shock propagation over a deformable particle THOMAS JACKSON, PRASHANTH SRIDHARAN, University of Florida, JU ZHANG, Florida Institute of Technology, SIVA BALACHANDAR, University of Florida — The interaction of strong shock waves with a deformable particle is an important fundamental problem in applications of multiphase flow; e.g., volcanic blasts, shock past a bubble, or explosives loaded with particles. In these applications the shock strength is greater than the yield strength of the particles, and as a result the particles will move and deform. We consider the impedance and shock-speed ratios, which define the nature of the deformation, for a variety of materials. Understanding the dynamic behavior of isolated particles at the microscale is important for developing point-particle models at the macroscale. Numerical results will be presented using the axisymmetric assumption to reduce computational costs. For a variety of shock strengths, we plot as a function of time a number of quantities, such as maximum particle temperature and pressure, mass integrated temperature and pressure, particle position. We also show results for non-spherical particles to determine the effect of particle shape. Here, we consider an ellipsoid align along or normal to the flow direction. Finally, preliminary results using a fully 3-D code will be presented.

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