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Numerical Simulation of Shock Interaction with Deformable Particles Using a Constrained Interface Reinitialization Scheme THOMAS L. JACKSON, PRASHANTH SRIDHARAN, University of Florida, JU ZHANG, Florida Institute of Technology, S. BALACHANDAR, University of Florida — In this work we present axisymmetric numerical simulations of shock propagating in nitromethane over an aluminum particle for post-shock pressures up to 10 GPa. The numerical method is a finite-volume based solver on a Cartesian grid, which allows for multi-material interfaces and shocks. To preserve particle mass and volume, a novel constraint reinitialization scheme is introduced. We compute the unsteady drag coefficient as a function of post-shock pressure, and show that when normalized by post-shock conditions, the maximum drag coefficient decreases with increasing post-shock pressure. Using this information, we also present a simplified point-particle force model that can be used for mesoscale simulations.

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