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Direct numerical simulations (DNS) to study the effect of particle motion and Reynolds number on the drag force during shock-particle interactions YASH MEHTA, JONATHAN D. REGELE, Los Alamos National Laboratory — The large disparity between length and time scales associated with explosive dispersal of particles makes the numerical study of these flows extremely challenging. With the recent availability of large-scale computational resources, the number of particle-resolved studies are increasing but most neglect particle motion, viscous effects or both. In the present study, we are interested in studying the effect of viscosity as well as motion on the drag forces experienced by a cluster of spherical particles during shock interaction. We are also interested in studying the anomalous drag reported by Bordoloi et al. (JFM Rapids 2017) in their experiments of a shock interacting with a dilute cloud of micro-particles. Towards this end, as a first step, we perform a direct numerical simulation of a spherical particle under shock-wave loading by solving the Navier-Stokes equations. We use an adaptive wavelet collocation method solver with volume penalization IBM for the particles.LA-UR-19-27293

Yash Mehta
Los Alamos National Laboratory

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