Abstract Submitted
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Shock Particle Interaction - Fully Resolved Simulations and Modeling[1] YASH MEHTA, CHRIS NEAL, THOMAS L. JACKSON, S. "BALA" BALACHANDAR, SIDDHARTH THAKUR, Univ of Florida - Gainesville — Currently there is a substantial lack of fully resolved data for shock interacting with multiple particles. In this talk we will fill this gap by presenting results of shock interaction with 1-D array and 3-D structured arrays of particles. Objectives of performing fully resolved simulations of shock propagation through packs of multiple particles are twofold, 1) To understand the complicated physical phenomena occurring during shock particle interaction, and 2) To translate the knowledge from microscale simulations in building next generation point-particle models for macroscale simulations that can better predict the motion (forces) and heat transfer for particles. We compare results from multiple particle simulations against the single particle simulations and make relevant observations. The drag history and flow field for multiple particle simulations are markedly different from those of single particle simluations, highlighting the effect of neighboring particles. We propose new models which capture this effect of neighboring particles. These models are called Pair-wise Interaction Extended Point Particle models (PIEP). Effect of multiple neighboring particles is broken down into pair-wise interactions, and these pair-wise interactions are superimposed to get the final model

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