Abstract Submitted
for the SHOCK19 Meeting of
The American Physical Society

Investigation of the Effects of Confinement on Particle Jet Formation in Cylindrical Explosive Dispersal of Particles[1] BERTRAND ROLLIN, Embry-Riddle Aeronautical University, FREDERICK OUELLET, RAHUL KONERU, JOSHUA GARNO, University of Florida - CCMT — The explosive dispersal of a layer of solid particles often gives rise to the formation of aerodynamically stable jet-like particle structures. All mechanisms contributing to the formation and selection of these late-time-appearing particle structures have yet to be identified, leading to a wide range of experimental and numerical investigations from several research groups. Generally studied in a spherical geometry, these energetic particle dispersals have recently been experimentally redesigned to occur in a cylindrical geometry, in an attempt at reducing the complexity of the problem. This numerical study focuses on the impact of introducing obstacles at both end of a bed of particles to confine the expansion of the explosive gases and particles into a pseudo-2D cylindrical geometry. Specifically, we present Eulerian-Lagrangian simulations of the sequence of events following the ignition of a PETN chord running through a bed of glass particles sandwiched between two beds of much denser iron powder. Analysis of the interplay between particles at the interface and their effects on the developing particle jets will be discussed.

[1]This work was supported by the U.S. Department of Energy, National Nuclear Security Administration, Advanced Simulation and Computing Program, as a Cooperative Agreement under the Predictive Science Academic Alliance Program, Contract No. DE-NA0002378.

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Date submitted: 28 Feb 2019 Electronic form version 1.4