Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Exploring the Early Structure of a Rapidly Decompressed Particle Bed HEATHER ZUNINO, R.J. ADRIAN, AMANDA CLARKE, BLAIR JOHNSON, Arizona State University, ARIZONA STATE UNIVERSITY COLLABORATION — Rapid expansion of dense, pressurized beds of fine particles subjected to rapid reduction of the external pressure is studied in a vertical shock tube. A near-sonic expansion wave impinges on the particle bed-gas interface and rapidly unloads the particle bed. A high-speed video camera captures events occurring during bed expansion. The particle bed does not expand homogeneously, but breaks down into horizontal slabs and then transforms into a cellular-type structure. There are several key parameters that affect the particle bed evolution, including particle size and initial bed height. Analyses of this bed structure evolution from experiments with varying particle sizes and initial bed heights is presented. This work is 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 and Academic Alliance Program, under Contract No. DE-NA0002378.

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Date submitted: 01 Aug 2017 Electronic form version 1.4