Abstract Submitted
for the SHOCK17 Meeting of
The American Physical Society

Microscale investigation of dynamic impact of dry and saturated glass powder ERIC HERBOLD, RYAN CRUM, RYAN HURLEY, JONATHAN LIND, MICHAEL HOMEL, MINTA AKIN, Lawrence Livermore Natl Lab — The response of particulate materials to shock loading involves complex interactions between grains involving fracture/comminution and possible interstitial material. The strength of saturated powders is attributed to "effective stress" where the fluid stiffens the material response and reduces the shear strength. However, detailed information regarding the effects of saturation under dynamic loading is lacking since static equilibrium between phases cannot be assumed and the interaction becomes more complex. Recent experiments at the dynamic compression sector (DCS) have captured in-situ images of shock loaded soda lime glass spheres in dry and saturated conditions. The differences between the modes of deformation and compaction are compared with mesoscale simulations to help develop our ideas about the observed response. This work was performed under the auspices of the U.S. Department of Energy (DOE) by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. LDRD tracking code 16-ERD-010. The Dynamic Compression Sector (DCS, sector 35) is supported by DOE/NNSA award number DE-NA0002442. The use of Advanced Photon Source is operated by Argonne National Laboratory under Contract No. DE-AC02-06CH11357.

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Date submitted: 24 Feb 2017 Electronic form version 1.4