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Role of Porosity in Dynamic Compaction via In-Situ X-Ray Probes[1] RYAN CRUM, Lawrence Livermore Natl Lab, DOROTHY MILLER, University of Tennessee, Knoxville, ERIC HERBOLD, JONATHAN LIND, Lawrence Livermore Natl Lab, RYAN HURLEY, Johns Hopkins University, MICHAEL HOMEL, Lawrence Livermore Natl Lab, BRIAN JENSEN, Los Alamos National Laboratory, MINTA AKIN, Lawrence Livermore Natl Lab — Granular systems are ubiquitous in our everyday world and influence many scientific problems including mine blasts, projectile penetration, and astrophysical collisions. Despite its significance, a fundamental understanding of granular media's behavior falls short of its solid counterpart, limiting predictive capabilities. Granular response is complex in part to the intricate interplay between numerous degrees of freedom not present in its solid equivalent. To address the role of geophysically relevant porosity in granular media, previous studies use VISAR or PDV, diagnostics that focus on the aggregate effect leaving the principal interactions of these multiple degrees of freedom too entangled to elucidate. This study uses a gas gun platform coupled to in-situ X-ray probe diagnostics to probe the role of porosity in dynamic compaction. Analyses include evaluating displacement fields and diffraction profiles. Results herein are directly compared to previous studies that were unable to include in-situ X-ray diagnostics.

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