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The effect of constitutive behavior in non-planar compaction response of distended media MATTHEW HUDSPETH, Los Alamos National Laboratory — Shock compaction of distended media is commonly performed within a typical 1-D framework with great emphasis placed on the development of compaction models used to describe a distended equation of state. Historically, minimal effort has been placed on exploring the effects of deviatoric stresses both across and behind a propagating wave within a porous medium, and as a result, non-planar wave evolution in such media is an often-neglected field. The focus of this talk is newly developed experimental techniques aimed at elucidating granular material strength. A dynamic loading platform coupled with X-ray (Dynamic Compression Sector at the Advanced Photon Source) has been utilized to diagnose non-planar wave evolution and material deformation within shocked granular bodies. Two different experimental configurations of distended media compaction were explored: (i) cylindrical drive Mach stem evolution and (ii) Richtmyer-Meshkov instability growth. CTH hydrocode simulations of the aforementioned experiments were performed to calibrate a pressure-dependent, geologically-based constitutive model. Resulting model applicability and future experimental designs will be discussed.

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