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A Continuum Theory for Shock Induced Heating of Metalized Explosive[1] KEITH GONTHIER[2], SUNADA CHAKRAVARTHY, Louisiana State University, CHAD RUMCHIK, Air Force Research Laboratory, AFRL-MNME — A well-developed continuum field theory for Deflagration-to-Detonation Transition (DDT) in granular explosive is generalized to account for the existence of an arbitrary number of condensed phases and a gas product phase. Formulation of the more generic theory is motivated by a desire to model both the low and high pressure impact response of metalized explosive for which the metal and explosive grains may have distinct average densities, velocities, temperatures, and sizes. The theory is consistent with the strong form of the dissipation inequality and allows for flexible partitioning of dissipation between phases. The theory is applied to inert impact of aluminized HMX in the limit of low gas pressure. Emphasis is placed on characterizing the spatial structure of planar deformation waves and its dependence on impact speed and initial metal mass fraction.

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