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Stochastic Modeling of the Reaction Response of Reactive Intermetallic-Forming Materials PAUL E. SPECHT, NARESH N. THAD-HANI, Georgia Institute of Technology, MEL R. BAER, Sandia National Laboratories — Microstructure at the meso-scale greatly affects the shock compression response of composites, due to the development of multiple wave interactions, that lead to complex loading scenarios. This microstructure-dependent response is inherently stochastic and lends itself to a probabilistic description. To understand this stochastic nature, three-dimensional simulations on a real, heterogeneous microstructure of a Ni and Al powder compact were performed in CTH, a Eulerian, finite volume hydrocode. These simulation results provide relationships between the mechanical and thermodynamic state of the composite under dynamic loading, which can be used for developing a probabilistic model for the bulk reaction response. Research funded by ONR/MURI grant No. N00014-07-1-0740.

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