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Meso-Scale Computational Study of the Dynamic Behavior of Co-Rolled Ni-Al Laminates[1] PAUL SPECHT, NARESH THADHANI, Georgia Institute of Technology, TIMOTHY WEIHS, Johns Hopkins University — Meso-scale computational analysis is used to study the shock-initiated reaction response of co-rolled Ni+Al laminates which provide an almost fully dense reactive system with continuous interparticle contacts. Laminates of composition ∼Al60Ni40 were prepared at Johns Hopkins University through rolling multiple Ni and Al foils with initial thicknesses of 127 μm and 178 μm, respectively, three times. The simulations are preformed using CTH on real, heterogeneous microstructures obtained through optical microscopy. The Baer-Nunziato nonequilbrium multiphase granular mixture model is utilized to model the reaction response of the materials during dynamic loading. Uniaxial strain experiments are also performed to validate the simulated responses so they can then be compared to previously obtained results for porous Ni-Al powder compacts.

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