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Dynamically driven phase transformations in damaged composite materials JEEYEON PLOHR, BRAD CLEMENTS, FRANK ADDESSIO, Los Alamos National Laboratory — A model developed for heterogeneous materials undergoing dynamically driven phase transitions in its constituents has been extended to allow for complex material micro-structures and the evolution of damage. In this work, damage is described by interfacial debonding and micro-crack growth. We have applied the analysis to silicon carbide-titanium (SiC-Ti) unidirectional metal matrix composites. In these composites, Ti can undergo a low pressure and temperature solid-solid phase transition. With these extensions we have carried out simulations to study the complex interplay between loading rates, micro-structure, damage, and the thermo-mechanical response of the system as it undergoes a solid-solid phase transformation.

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