SIMULATION OF DAMAGE EVOLUTION IN DISCONTINUOUSLY REINFORCED COMPOSITES: A PHASE-FIELD MODELING APPROACH

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ABSTRACT

First, a phase-field model for elastic-plastic solids obeying von Mises yield criterion will be described. Then, this phase-field model will be extended to simulate the damage evolution due to nucleation and growth of voids in ductile matrix for discontinuously reinforced composites. The role of reinforcement morphology and the modulus effects leading to final failure all included in the simulations in an effort to make a parametric investigation. The advantages and disadvantages of such phase-field modeling approach in comparison to well established other continuum methods will be elucidated.