

Numerical method for a damage model with phase separation

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Damage models are a smoothed description of free evolving cracks in an elastic material under mechanical loading. In binary alloys, cracks and damage are aligned with phase boundaries. As the microstructure of the mixture coarsens over time, there is interaction between damage and phase separation.

In this talk, a finite element method for a combined model of elasticity, damage and phase separation is presented and analyzed. In contrast to conventional phase field models, there is a non-smooth constraint due to the exclusion of healing of material. Convergence of the method is analyzed and results of numerical simulations are presented.