

Evolution of Elastically Stressed Precipitates

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The evolution of precipitates in stressed solids is modeled by coupling a quasi-steady diffusion equation and a linear elasticity equation with dynamic boundary conditions. The governing equations are solved numerically using a boundary integral method. We present a fast adaptive treecode algorithm for the diffusion and elasticity problems in two dimensions. We also give a space-time rescaling scheme for computing the long time evolution of multiple precipitates. We demonstrate the effectiveness of the parallel treecode and the rescaling scheme by studying the effect of elasticity in long-time morphological evolution of precipitates.