Celia Reina

University of Pennsylvania

Mechanical Engineering and Applied Mechanics

A multiscale perspective on the kinematics of elastoplasticity

Abstract

Standard continuum models of elastoplasticity in the setting of large deformations are based on the kinematic assumption $F = FeFp$, which decomposes the total deformation, F, into the elastic and plastic contribution to the deformation, Fe and Fp respectively. Besides its current acceptance, it has been largely debated in the literature and many issues still remain unresolved. In this talk we present some advances in this direction via multiscale analyses of single crystals from discrete dislocations to the continuum scale.