

A Multiscale Analysis on the Kinematics of Elastoplasticity

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