

# A simple non-hardening rate-independent constitutive model for HCP polycrystals deforming by slip and twinning<sup>1</sup>

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A continuum approach is presented for predicting the constitutive response of HCP polycrystals using a simple non-hardening constitutive model incorporating both slip and twinning. A physically based methodology is introduced for restricting the amount of the twinning activity. A continuum approach is used for modeling the texture evolution that eliminates the need for increasing the number of discrete crystal orientations to account for new orientations created by twinning during deformation. The polycrystal is represented by an orientation distribution function using the Rodrigues parameterization. Numerical examples are used to show the application and accuracy of the methodology for modeling deformation processes.

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