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Hysteresis in Kinking Nonlinear Elastic Solids and the Preisach-Mayergoyz Model PETER FINKEL, AIGUO ZHOU, Drexel University, GARY FRIEDMAN, Drexel University, MICHEL BARSOUM, Drexel University — We show that the stress-induced, dislocation-based, elastic hysteric loops of kinking nonlinear elastic solids – polycrystalline cobalt, Ti₃SiC₂ and a 10 vol. % porous Ti₂AlC - obey the scalar Preisach-Mayergoyz phenomenological model because they exhibit wipe-out and congruency, two necessary and sufficient tenets of the model. We also present experimental proof of the applicability of the model for the prediction of the response of these materials to complex stress histories.

Peter Finkel
Drexel University

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