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Verification of modified Jiles-Atherton model for determination of hysteresis behavior of materials with two ferromagnetic phases NEELAM PRABHU GAUNKAR, Iowa State University, Ames, Iowa, CAJETAN NLEBEDIM, Ames Laboratory, US DOE, Iowa State University, Ames, Iowa, DAVID JILES, Department of Electrical and Computer Engineering, Iowa State University, Ames, Iowa — Robust theoretical models of hysteresis are important for describing the properties of ferromagnetic materials. Of the available hysteresis models, the J-A model is widely studied. Efforts have been made to modify and extend the applicability of this model and to improve its accuracy in accounting for different conditions that affect the magnetic state of ferromagnetic materials, such as stress. Recently, the J-A model has been extended to describe the ferromagnetic hysteresis in two-phase magnetic materials. Modeling hysteresis of multi-phase ferromagnetic materials is crucial especially due to the need to develop high performance composite magnetic structures. In this study, the extension of the J-A to accommodate materials with two ferromagnetic phases is experimentally verified. The approach to extracting of the J-A model parameters including saturation magnetization (M_s), domain coupling factor (α), domain density (a), reversibility (c) and pinning coefficient (k) in two-phase materials will be presented.

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