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Switching field distributions in nanoisland arrays with perpendicular magnetic anisotropy SUSAN KEMPINGER, ROBERT FRALEIGH, PAUL LAMMERT, VINCENT CRESPI, The Pennsylvania State University, PETER SCHIFFER, University of Illinois at Urbana Champaign, NITIN SAMARTH, The Pennsylvania State University — Experimental measurements of the magnetization switching process in dipole coupled arrays of single domain magnetic islands can provide important insights into the dynamical properties of interacting spin systems. Lithographically patterned arrays of interacting nanoscale islands of Co/Pt multilayers provide a useful model system in this context because the perpendicular magnetic anisotropy allows the use of diffraction-limited Kerr imaging to track the magnetization states of individual islands as a function of an external magnetic field. We are able to optically resolve, spatially isolate, and extract the switching field of each island in an array. The interaction strength is tuned by changing the geometry and the spacing between islands. Comparisons of data from strongly and weakly interacting arrays demonstrate the effect of the dipolar interactions. To further demonstrate the effectiveness of our local approach to measuring switching field distributions, we compare to the Δ H(M, Δ M) method, commonly used for bit-patterned media to separate the intrinsic and magnetic dipolar contributions to a switching field distribution. We show that our local measurements are in good agreement with these global measurements, and that interactions cause broadening of the distributions. This project was funded by the US Department of Energy, Office of Basic Energy Sciences, Materials Sciences and Engineering Division under Grant No. DE-SC0010778

Susan Kempinger
The Pennsylvania State University

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