Abstract Submitted
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Micromagnetic simulated magnetization reversal of nickel three-dimensional anti-sphere arrays[1] ANDY CLARK, LE YU, CASSIE WANG, Bryn Mawr College, KRISTEN BUCHANAN, Colorado State University, XUE-MEI CHENG[2], Bryn Mawr College — Technical advances in electrochemical deposition using self-assembled colloidal polystyrene templates has resulted in efficient and low-cost fabrication of large samples containing three-dimensional anti-sphere arrays (3DAAs). 3DAAs with periodic structure and high surface-to-volume ratio provide an ideal system for studying the effect of dimensionality and morphology on magnetic properties. Micromagnetic simulations were performed using the object oriented micromagnetic framework (OOMMF) and mumax3 to study the magnetization reversal behaviors in a nickel 3DAAs structure with anti-sphere radii of 98nm and 252nm and varying sample thickness between 98nm-1.5μm. The simulation results show that domain propagation dominates in the lowest quasi-continuous layer, whereas the reversal process becomes more localized in the void-heavy upper layers. As the structure thickness increases, the proportion of the quasi-continuous layer decreases and stronger pinning appears in the upper layers, resulting in a transition from a domain-growth reversal to a localized reversal.

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