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Transition states of magnetization reversal in ferromagnetic nanorings GABRIEL CHAVES-O'FLYNN, ANDREW KENT, DANIEL STEIN, New York University — Thin ferromagnetic rings are of interest for fundamental studies of magnetization reversal, in part, because they are a rare example of a geometry for which an analytical solution for the rate of thermally induced switching has been determined [1]. The theoretical model predicts the transition state to be either a global magnetization rotation of constant azimuthal angle or a localized fluctuation, denoted the instanton saddle. Numerically we have confirmed that for a range of values of external magnetic field and ring size the instanton saddle is energetically favored [2]. The model takes the annular width to be small compared to the mean radius of the annulus; in which case the main contribution to the magnetization energy comes from the surface magnetostatic energy. We present numerical micromagnetic calculations of the activation energy for thermally induced magnetization reversal for the two different transition states for the case when the annular width is equal in magnitude to the mean radius of the ring. Results of the total and surface magnetostatic energies are compared for different ring sizes. [1] K. Martens, D.L. Stein, A.D. Kent, PRB 73, 054413 (2006) [2] G.D. Chaves-O'Flynn, K. Xiao, D.L. Stein, A. D. Kent, arXiv:0710.2546 (2007)

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