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Numerical Studies of Magnetization Reversal in Thin Annular Nanorings GABRIEL CHAVES-O'FLYNN, ANDREW KENT, DANIEL STEIN, DANIEL BEDAU, New York University, NEW YORK UNIVERSITY TEAM — The rate of thermally activated magnetization reversal in thin ferromagnetic nanorings has been found analytically in a 1D model in which the demagnetization energy is approximated by a local surface term [1]. Numerical micromagnetic calculations confirm all aspects of the analytic model for narrow thin rings, such as permalloy rings of 200 nm mean radius, 40 nm width and 2 nm thickness [2]. However, the model breaks down in for extremely wide rings, when the ring width approaches its mean diameter. Here we present numerical micromagnetic results for the transition states between the clockwise and counterclockwise state in this limit. We describe how the two transition configurations of narrow rings cease to be saddles of the energy functional. Also, a new low energy metastable state is found to exist for a narrow range of fields. We discuss the results of applying the String Method [3] to determine the transition states and energy barriers between the lowest magnetization configurations of rings. [1] K. Martens, D.L. Stein, and A.D. Kent, PRB 73, 054413 (2006) [2] G. D. Chaves-O'Flynn, D.L. Stein, and A.D. Kent, arXiv:0811.0440 (2008) [3] W. E, W. Ren, E. Vanden-Eijnden, J. Chem. Phys 126, 164103 (2007)

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