

Abstract Submitted  
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**Non-Arrhenius** **Ferromagnetism In 1D Systems** LUCA SPADAFORA, FAUSTO BORGONOV, Dipartimento di Matematica e Fisica, Università Cattolica, via Musei 41, 25121, Brescia, Italy, LUCA CELARDO, Department of Physics, Tulane University, New Orleans, LA 70118, BRUNO GONCALVES, Emory University, Atlanta, Ga 30322 — Topological phase space disconnection has been recently found to be a general phenomenon in isolated anisotropic spin systems. This phenomenon sets a general framework to understand the emergence of ferromagnetism in finite magnetic systems. Here we study its relevance for finite systems in contact with a heat bath. The existence of this threshold, inducing extremely large magnetic reversal time, is shown to be able to determine metastable ferromagnetic behavior in finite samples. Also, it acts as a real energy barrier. Under suitable conditions the law for average reversal times can be obtained analytically and confirmed numerically. Consistent differences from the expected Arrhenius law of reversal times are shown for short range interacting spin systems.

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