

Abstract Submitted
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The role of geometrical symmetry on thermally activated processes in clusters of interacting dipolar moments¹ ONDREJ HOVORKA, University of Southampton, UK, JOE BARKER, University of York, UK, GARY FRIEDMAN, Drexel University, USA, ROY CHANTRELL, University of York, UK — Thermally activated magnetization decay is studied in ensembles of clusters of interacting dipolar moments by applying the master-equation formalism, as a model of thermal relaxation in systems of interacting single-domain ferromagnetic nanoparticles. Solving the associated master-equation reveals a breakdown of the energy barrier picture depending on the geometrical symmetry of structures. Deviations are most pronounced for reduced symmetry and result in a strong interaction dependence of relaxation rates on the memory of initialization of an ensemble. Developed is a simple two-state system description of an ensemble, which accounts for the observed anomalies. These results follow from a semi-analytical treatment, and are fully supported by kinetic Monte-Carlo simulations.

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