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Dynamics of magnetization in artificial spin ice on kagome[1] OLGA PETROVA, YICHEN SHEN, Johns Hopkins University, PAULA MELLADO, Harvard University, OLEG TCHERNYSHYOV, Johns Hopkins University — We model magnetization dynamics in artificial spin ice on kagome under an applied magnetic field. Magnetization reversal is mediated by domain walls carrying two units of magnetic charge emitted from and absorbed by lattice junctions and propagating along the wires. The Coulomb interaction between magnetic charges induces avalanches in magnetization reversal. Distributions of avalanche lengths for various angles between the initial magnetization and the applied magnetic field were considered. We used a Gaussian distribution in the magnitude of the links' critical fields to mimic disorder in a real system [1]. An asymmetric distribution of topological defects at a wire junction gives rise to an offset angle α in the reversal field $H(\theta) = H_c/\cos(\theta + \alpha)$ where θ is the angle between the link and the applied magnetic field [2]. The model reproduces the salient features of magnetization reversal curves observed experimentally.

[1] Y. Qi, T. Brintlinger, and J. Cumings, Phys. Rev. B **77,** 094418 (2008).
[2] P. Mellado, O. Petrova, Y. Shen, and O. Tchernyshyov, Phys. Rev. Lett. **105,** 187206 (2010).

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Olga Petrova
Johns Hopkins University

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