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Magnetization reversal in artificial kagome ice. PAULA MELLADO, OLEG TCHERNYSHYOV, Johns Hopkins University, YI QI, TODD BRINTLINGER, JOHN CUMINGS, Dept. of Materials Sci. and Eng., Univ. of Maryland — We study magnetization dynamics in an artificial kagome spin ice realized as a honeycomb network of connected ferromagnetic nanowires [1]. Our model is focused on magnetic charges defined as the flux of magnetization into a network site. In this system, the allowed values of magnetic charge are ± 1 and ± 3, while in the original square ice [2] they are 0, ± 2, and ± 4. The ice rule is equivalent to the minimization of the absolute value of magnetic charge. In our model, magnetization reversal in a given link is triggered when the total magnetic field at one of its sites reaches a critical value and the site emits a domain wall with charge ± 2, which propagates the entire length of the link reversing the magnetization. The resulting redistribution of magnetic charges provides a positive feedback by increasing the local values of the magnetic field at neighboring sites. A sufficiently strong feedback triggers an avalanche-like reversal observed experimentally. That and an inherently dissipative character of the reversal process suggest interesting parallels with granular materials and sheds light on the physics of rotational demagnetization of spin ice [3]. Supported by NSF Grant DMR-0348679. [1] M. Tanaka *et al.*, Phys. Rev. B **73**, 052411 (2006). [2] R. F. Wang *et al.*, Nature **439**, 303 (2006). [3] C. Nisoli *et al.*, Phys. Rev. Lett. **98**, 217203 (2007).

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