Abstract Submitted
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Nanoscale SEMPA imaging of an artificial quasicrystal spin ice at remanence[1] ANDREW BALK, Center for Nanoscale Science and Technology, National Institute of Standards and Technology. Maryland Nanocenter, University of Maryland, VINAYAK BHAT, BARRY FARMER, LANCE DELONG, University of Kentucky, Department of Physics and Astronomy, JOHN UNGURIS, Center for Nanoscale Science and Technology, National Institute of Standards and Technology., ELECTRON PHYSICS GROUP, CNST TEAM — Artificial spin ice has emerged in the past decade as a model metamaterial for studying frustrated magnetic ordering at length scales large enough to be experimentally probed in real space. Recently, complex designs have been engineered to explore exotic behavior in non-square lattices. However, direct measurements of the actual moment directions have not been very common, and interpretation from techniques such as magnetic force microscopy and magneto-optical Kerr effect magnetometry can be complicated by the more complex geometries. Here we demonstrate using SEMPA (scanning electron microscopy with polarization analysis) as a method to robustly measure the ordering direction of elements in a connected artificial quasicrystal. We discuss the applicability of SEMPA to this system, details of the imaging and potential artifacts, and conclusions that can be drawn from the nanoscale two dimensional maps of the moment direction.

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