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Anomalous magnetization dynamics in artificial spin ice[1] S.K. MISHRA, Advanced Light Source, Lawrence Berkeley National Laboratory Berkeley, CA 94720-8229, USA, V.S. BHAT, Department of Physics and Astronomy and Center for Advanced Materials, University of Kentucky, Lexington, KY 40506-0055, USA, D.H. PARKS, J.T. LEE, X. SHI, Advanced Light Source, Lawrence Berkeley National Laboratory Berkeley, CA 94720-8229, USA, L.E. DELONG, Department of Physics and Astronomy and Center for Advanced Materials, University of Kentucky, Lexington, KY 40506-0055, USA, S.D. KEVAN, S. ROY, Advanced Light Source, Lawrence Berkeley National Laboratory Berkeley, CA 94720-8229, USA, ADVANCED LIGHT SOURCE TEAM, UNIVERSITY OF KENTUCKY TEAM
— Modern nanotechnology permits one to mimic bulk spin ice crystals with ordered arrays of ferromagnetic nano-islands, which constitute a method for designing fully controlled model systems for studies of frustrated magnetic interactions in two dimensions. Thermal fluctuations within a highly degenerate ground state excite topological magnetic charges, but the nature of the field-dependent equilibrium states and their magnetic dynamics has remained elusive. Here we present results of time dependent, coherent speckle intensity and X-ray correlation spectroscopy (XPCS) in a diffraction geometry, which yields information concerning the dynamics of emergent topological charge defects in a square artificial spin ice.

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Shrawan Mishra
Lawrence Berkeley Natl Lab

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