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Tunable Algebraic Correlations on a Kagome Lattice ALEXANDRA TURRINI, Paul Scherrer Institute, University of Geneva, Switzerland, PATRIK HENELIUS, KTH Stockholm, PETER HOLDSWORTH, ENS Lyon, TOM FENNELL, Paul Scherrer Institute, Switzerland — Application of a moderate magnetic field along the [111] direction of a pyrochlore spin ice such as $Ho_2Ti_2O_7$ results in a magnetization plateau known as kagome ice. In kagome ice, the three dimensional spin ice physics of the pyrochlore lattice (Coulomb phase, monopole excitations, and Pauling entropy) is confined to a stack of kagome lattices, resulting in a quasi-two-dimensional Coulomb phase with algebraic spin correlations, modified ice rules, and restricted residual entropy. The kagome ice spin configurations map to the honeycomb dimer model originally studied by Kasteleyn, in which an unconventional phase transition was predicted as a consequence of modifying dimer activity on different families of links. In kagome ice, this effect should be achieved by tilting the magnetic field to modify the degeneracy of the spin configurations. A universal scaling of the algebraic correlations as they are tuned toward the transition as a function of field, temperature, or tilt is predicted, and the tuning is manifested by the drifting of features in the structure factor as any of these control parameters are modified. We investigate the scaling behavior using polarized neutron diffuse scattering measurements.

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