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【640】Phase Transitions and Magnetic Order in a Ruby Lattice Artificial Spin Ice

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Artificial spin ice are arrangements of dipolar coupled nanomagnets, which exhibit a range of interesting behaviour. Here, we study an artificial spin ice based on the ruby lattice. This pattern has a complex unit cell with 12 nanomagnets and two lattice constants that define it. By varying the two lattice constants independently, we can change the interaction between nanomagnets. Using x-ray photoemission electron microscopy we observed different ordering mechanisms depending on the lattice constants. Moreover, the system can order in one or two steps as shown by Monte Carlo simulations.

Theoretical Work

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