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【636】 Full dipolar model for the Archimedean lattices of spin ices

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Artificial spin ices are arrays of dipolar-coupled single domain nanomagnets, which exhibit rich behaviour. We study a family of artificial spin ices, formed by placing out-of-plane nanomagnets on the vertices of the Archimedean lattices. By demagnetising these arrays using field protocols and imaging their configuration using magnetic force microscopy, we observe different types of magnetic ordering.

We use experimental results and the Metropolis Monte Carlo simulations to obtain the residual entropy, magnetic correlations and effective temperatures for various lattice types. This allows us to catalogue the behaviour for lattices with varying frustration in the framework of a full dipolar model.

Theoretical Work

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