

Monte Carlo simulations of the frustrated FCC Kagome lattice.

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ABSTRACT: Previous research on frustrated magnetic systems has typically been focused on the short range interactions, with much less attention dedicated to the behaviour of the system with long range, dipolar interactions due to their computational complexity and relative weakness. Studies of the two-dimensional dipolar FCC kagome system have revealed a ground state discrete degeneracy with domain walls and a phase transition at finite temperature. Preliminary three-dimensional results for this lattice have instead observed a continuous degeneracy in two variables.

Monte Carlo simulations of the classical Heisenberg model on the three-dimensional FCC kagome lattice, built from ABC stacked Kagome planes along the (111) axis, using only dipolar interactions at finite temperatures are presented. The temperature and system size dependence of the energy and magnetization of the system are calculated and evidence of a phase transition is observed. The effects of temperature and lattice size on correlation times of this system, as well as attempts to reduce computational complexity using clustering algorithms are also examined.

ALL ARE WELCOME!!!