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Probing Ferromagnetic Order in a 2D Heisenberg Ferromagnet with Random Anisotropy DONALD PRIOUR, Youngstown State University — We consider a Heisenberg Model on a two dimensional square lattice with magnetic interactions among neighboring magnetic moments. Although moments in the unperturbed isotropic system may be aligned locally with large correlation lengths at low temperatures, long range ferromagnetic order (consistent with the Mermin-Wagner Theorem) vanishes for finite temperatures. For each pair of interacting spins, we superimpose a random anisotropy term with an equal likelihood of favoring alignment perpendicular or parallel to the plane of the crystal lattice; although root mean square measures of the anisotropy are finite, the mean is zero. Using Monte Carlo calculations, we calculate relevant thermodynamic quantities such as the magnetization and the magnetic susceptibility. A finite size scaling analysis (i.e. Binder cumulant intersections and quantitively guided data collapses employed as complementary approaches) is used to determine if long range ferromagnetic order is supported for $T > 0$. For the low temperature regime, we discuss a spin wave analysis to determine if random anisotropy terms stabilize a finite excitation energy for long wavelength spin waves and thereby lead to the preservation of finite temperature long range ferromagnetism.

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