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Nematic order in square lattice frustrated ferromagnets TSUTOMU MOMOI, Condensed Matter Theory Laboratory, RIKEN, NIC SHANNON, H. H. Wills Physics Laboratory, University of Bristol, PHILIPPE SINDZINGRE, LPTMC, UMR 7600 of CNRS, Universite P. et M. Curie — We present a new scenario for the breakdown of ferromagnetic order in a two–dimensional quantum magnet with competing ferromagnetic and antiferromagnetic interactions. In this, dynamical effects lead to the formation of two–magnon bound states, which undergo Bose–Einstein condensation, giving rise to bond–centered nematic order. This scenario is explored in some detail for an extended Heisenberg model on a square lattice. In particular, we present numerical evidence confirming the existence of a state with d– wave nematic correlations but no long range magnetic order, lying between the saturated ferromagnetic and collinear antiferromagnetic phases of the ferromagnetic J_1–J_2 model. We argue by continuity of spectra that this phase is also present in a model with 4–spin cyclic exchange. The case of the multiple spin exchange model on a triangular lattice, relevant to magnetism of solid ^{3}He films, is also discussed.

Tsutomu Momoi
RIKEN

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