

Abstract Submitted
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Quantum phase transitions in triangular lattice Heisenberg anti-ferromagnet in a magnetic field MENGXING YE, ANDREY CHUBUKOV, Univ of Minnesota - Twin Cities — We present the zero temperature phase diagram of a large S Heisenberg anti-ferromagnet on a frustrated triangular lattice with the nearest neighbor (J_1) and the next nearest neighbor (J_2) interactions, in a magnetic field. We show that the classical model has an accidental degeneracy for all J_2/J_1 and all fields below the saturation field, which gives rise to the extended manifold of the ground state spin configurations. Quantum fluctuations, however, lift this degeneracy. For small J_2/J_1 , they select one of three different co-planar states, depending on the field value. We argue that above some critical ratio of J_2/J_1 , which weakly depends on a magnetic field, these fluctuations select the stripe phase. We analyze in detail the mechanism of the selection of the stripe phase and explore the nature of the quantum phase transition in a magnetic field between the ordered phases as J_2/J_1 passes through a critical value.

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