

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Variational studies of Triangular Heisenberg Antiferromagnet in magnetic field TIAMHOCK TAY, OLEXEI I. MOTRUNICH, California Institute of Technology — We present a variational study of the Heisenberg antiferromagnet on the spatially anisotropic triangular lattice in magnetic field. First we construct a simple yet accurate wavefunction for the $1/3$ -magnetization plateau *uud* phase on the isotropic lattice. Beginning with this state, we obtain natural extensions to nearby commensurate planar phases on either side of the plateau which are present for low lattice anisotropy. Far away from the $1/3$ plateau and for significant anisotropy, incommensurate states have better energetics. In the highly anisotropic regime, our study shows strong signatures of quasi-1d physics. The variational study is supplemented by exact diagonalization calculations which provide a reference for testing the energetics of our trial wavefunctions as well as helping to identify candidate phases.

Tiamhock Tay
California Institute of Technology

Date submitted: 19 Nov 2009

Electronic form version 1.4