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Study of the Magnetic Phase Transition in Hubbard Model on the Triangular Lattice at 1/3 Electron Density SHAN DAI, RICHARD SCALETTAR, University of California, Davis — The recent discovery of sodium cobaltate (Na_xCoO_2) has caught strong scientific interest. To gain qualitative understanding of its properties, we study the transition between the magnetic and paramagnetic phases in the triangular lattice Hubbard model at 1/3 filling, using mean field theory. At this density, the electrons can avoid magnetic frustration through localization on a honeycomb sublattice. That is, charge ordering might arise through minimizing the magnetic exchange energy J=$4t^2$/U (at the expense of a higher kinetic energy t). We find that such charge ordering does indeed occur at sufficiently low temperature T, and that, within the magnetic phase, the spin order parameter increases with a critical exponent beta=1/2 near T_c. In contrast, the the charge order parameter increases linearly with T_c-T. In the ground state, the system is always in the paramagnetic phase when U/t < 4.5.

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