Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Spin-liquid versus spiral-order phases in the anisotropic triangular lattice LUCA F. TOCCHIO, HELENE FELDNER, Institut für Theoretische Physik, Goethe-Universität Frankfurt/Main, 60438 Frankfurt, Germany, FEDERICO BECCA, CNR-IOM-Democritos National Simulation Centre and SISSA, Via Bonomea 265, I-34136, Trieste, Italy, ROSER VALENTI, CLAUDIUS GROS, Institut für Theoretische Physik, Goethe-Universität Frankfurt/Main, 60438 Frankfurt, Germany — We study the competition between magnetic and spin-liquid phases in the Hubbard model on the anisotropic triangular lattice, which is described by two hopping parameters t and t' in different spatial directions and is relevant for layered organic charge-transfer salts. By using a variational approach that includes spiral magnetic order, we provide solid evidence that a spin-liquid phase is stabilized in the strongly-correlated regime and close to the isotropic limit $t'/t = 1$. Otherwise, a magnetically ordered spiral state is found, connecting the (collinear) Néel and the (coplanar) 120° phases. The pitch vector of the spiral phase obtained from the unrestricted Hartree-Fock approximation is substantially renormalized in presence of electronic correlations, and the Néel phase is stabilized in a wide regime of the phase diagram, i.e., for $t'/t < 0.75$. We discuss these results in the context of organic charge-transfer salts

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Date submitted: 27 Nov 2012 Electronic form version 1.4