Title:	Noncollinear and noncoplanar magnetic order in the extended Hubbard model on anisotropic triangular lattice
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Keywords:	Anisotropic triangular lattice Hubbard model Noncollinear Noncoplanar magnetic order
Issue Date:	2016
Publisher:	American Physical Society
Citation:	Physical Review B, 93(19)
Abstract:	Motivated by the importance of noncollinear and noncoplanar magnetic phases in determining various electrical properties in magnets, we investigate the magnetic phase diagram of the extended Hubbard model on an anisotropic triangular lattice. We map out the ground-state phase diagram within a mean-field scheme that treats collinear, noncollinear, and noncoplanar phases on equal footing. In addition to the standard ferromagnet and 120◦ antiferromagnet states, we find the four-sublattice flux, the 3Q noncoplanar, and the noncollinear charge-ordered states to be stable at specific values of filling fraction n. Inclusion of a nearest-neighbor Coulomb repulsion leads to intriguing spin-charge-ordered phases. The most notable of these are the collinear and noncollinear magnetic states at n=2/3, which occur together with a pinball-liquid-like charge order. Our results demonstrate that the elementary single-orbital extended Hubbard model on a triangular lattice hosts unconventional spin-charge ordered phases, which are similar to those reported in more complex and material-specific electronic Hamiltonians.
URI:	https://journals.aps.org/prb/abstract/10.1103/PhysRevB.93.195110 (https://journals.aps.org/prb/abstract/10.1103/PhysRevB.93.195110) http://hdl.handle.net/123456789/2391 (http://hdl.handle.net/123456789/2391)
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