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Ground State Phase Diagram of the Heisenberg Model on Anisotropic Triangular Lattice. TOMMASO PARDINI, RAJIV R.P. SINGH, University of California, Davis — We study the spin-half and spin-one Heisenberg models on the anisotropic triangular lattice with interactions J_1 and J_2. The model interpolates between the limits of square lattice ($J_1 = 0$), triangular lattice ($J_1 = J_2$) and decoupled one dimensional linear chains ($J_2 = 0$). Results are obtained by means of linked-cluster series expansions around the colinear antiferromagnetic phase (CAF) and the non colinear antiferromagnetic phase (NCAF), also known as the spiral phase. For the spin-half model, both phases can be stabilized within our calculations for small J_2. However, the NCAF phase always appears to have a lower energy. The pitch of the spiral is substantially renormalized from the classical values. For the spin-one model, we find a transition from the Haldane gap phase to the NCAF phase as a function of J_1/J_2. Interchain coupling required for this transition is more than a factor of 30 larger than when the chains are coupled in an unfrustrated square-lattice geometry. The CAF phase does not appeared to be stabilized for any value of J_1/J_2 for the spin-one model.

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