Abstract for an Invited Paper
for the MAR09 Meeting of
The American Physical Society

Spatially anisotropic Heisenberg kagome antiferromagnet

OLEG STARYKH, University of Utah

We study the quasi-one-dimensional limit of the spin-1/2 quantum Heisenberg antiferromagnet on the kagome lattice. The lattice is divided into antiferromagnetic spin-chains (exchange J) that are weakly coupled via intermediate "dangling" spins (exchange J'). Using one-dimensional bosonization, renormalization group methods, and current algebra techniques the ground state is determined in the limit $J' \ll J$. We find that the dangling spins and chain spins form a spiral with $O(1)$ and $O(J'/J)$ static moments, respectively, atop of which the chain spins exhibit a smaller $O[(J'/J)^2]$ antiferromagnetically ordered component along the axis perpendicular to the spiral plane. We describe similarities and differences of our findings with other recent studies, based on semi-classical and large-N approaches. Critical comparison of quasi-one-dimensional kagome antiferromagnet with other quasi-one-dimensional models will be presented as well.