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“Dynamics of the  $S=1/2$  Heisenberg Antiferromagnet on the Triangular Lattice”

We present the dynamical spin structure factor of the antiferromagnetic spin-1/2  $J_1 - J_2$  Heisenberg model on a triangular lattice obtained from large-scale matrix-product state simulations. The high frustration due to the combination of antiferromagnetic nearest and next-to-nearest neighbor interactions yields a rich phase diagram. We resolve the low-energy excitations both in the 120 degree-ordered phase and in the putative spin liquid phase at  $J_2/J_1 = 0.125$ . In the ordered phase, we observe an avoided decay of the lowest magnon-branch, demonstrating the robustness of this phenomenon in the presence of gapless excitations. Our findings in the spin-liquid phase chime with the field-theoretical predictions for a gapless Dirac spin liquid, in particular the picture of low-lying monopole excitations at the corners of the Brillouin zone.

[ Markus Drescher, Laurens Vanderstraeten, Roderich Moessner, Frank Pollmann, arXiv:2209.03344]