Codimension-Two Spiral Spin-Liquid in the Effective Honeycomb-Lattice Compound $Cs_3Fe_2Cl_9$

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A codimension-two spiral spin-liquid is a correlated paramagnetic state with one-dimensional ground state degeneracy hosted within a three-dimensional lattice. Here, via neutron scattering experiments and numerical simulations, we establish the existence of a codimension-two spiral spin-liquid in the effective honeycomb-lattice compound $Cs_3Fe_2Cl_9$ and demonstrate the selective visibility of the spiral surface through phase tuning. In the long-range ordered regime, competing spiral and spin density wave orders emerge as a function of applied magnetic field, among which a possible order-by-disorder transition is identified.

Reference:

S. Gao, et al., arXiv2405.18973 (2024)