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Staggered magnetization and low-energy magnon dispersion in the multiferroic skyrmion host Cu2OSeO3[1] GUY G. MARCUS, BENJAMIN A. TRUMP, JONAS KINDERVATER, Institute for Quantum Matter and Jonhs Hopkins University, LACY L. JONES, MATTHEW B. STONE, Quantum Condensed Matter Division, Oak Ridge National Laboratories, TYREL M. MCQUEEN, Institute for Quantum Matter and Jonhs Hopkins University, COLLIN L. BROHOLM, Institute for Quantum Matter, Jonhs Hopkins University, and Quantum Condensed Matter Division, Oak Ridge National Laboratories — We present neutron diffraction and inelastic scattering of the insulating helimagnet, Cu_2OSeO_3 which provide evidence for staggered magnetization and elucidate the associated low-energy magnon spectrum. The modulation wavelength of approximately $\lambda \approx 50$ nm detected at antiferromagnetic Bragg points is of the same length scale as previously reported for the skyrmion lattice. This superstructure evidences the composite nature of the spin-1 tetrahedra that form the topological magnetic structure of the material. To understand the interplay of ferrimagnetism and long wavelength modulated magnetism, we have performed inelastic neutron scattering on a co-aligned sample of chemical vapor transport grown single crystals. We shall present the low-energy magnon dispersion and infer an effective spin Hamiltonian to account for the long-wavelength, low-energy magnetism of Cu_2OSeO_3.

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