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Magnetic excitations in BaFe₂Se₃¹ SHAN WU, M. MOURIGAL, Johns Hopkins University, J.R. NIELSON, Colorado State University, M.B. STONE, ORNL, T.M. MCQUEEN, C. BROHOLM, Johns Hopkins University — The ladder-like relative of the iron superconductors, BaFe₂Se₃, has recently been successfully synthesized and its thermo-magnetic and structural properties explored. Magnetic neutron diffraction and susceptibility data clearly reveal magnetic long-range order below $T_N = 256\text{K}$. The proposed magnetic structure consists of anti-ferromagnetically aligned ferromagnetic blocks. To understand the origin of square plaquette formation, we carried out inelastic neutron scattering experiments on powder samples of BaFe₂Se₃. We identify spin-wave-like low energy excitations in the ordered state. The wave vector dependence of the low energy magnetic scattering is consistent with $\mathbf{k}=(1/2,1/2,1/2)$ magnetic ordering. Comparison to a spin wave theory provides estimates for the dominant exchange interactions in BaFe₂Se₃.

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