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Inelastic neutron scattering studies of $YFeO_3$ STEVEN HAHN, ANDREY PODLESNYAK, Quantum Condensed Matter Division, Oak Ridge National Laboratory, RANDY FISHMAN, Materials Science and Technology Division, Oak Ridge National Laboratory, GARRETT GRANROTH, Quantum Condensed Matter Division, Oak Ridge National Laboratory, ALEXANDER KOLESNIKOV, Chemical and Engineering Materials Divison, Oak Ridge National Laboratory, EKATERINA POMJAKUSHINA, KAZIMIERZ CONDER, Laboratory for Developments and Methods, Paul Scherrer Institut, GEORG EHLERS, Quantum Condensed Matter Division, Oak Ridge National Laboratory — Spin waves in the the rare earth orthorferrite $YFeO_3$ have been studied by inelastic neutron scattering and analyzed with a full four-sublattice model including contributions from both the weak ferromagnetic and hidden antiferromagnetic orders. Antiferromagnetic (AFM) exchange interactions of $J_1 = -4.23 \pm 0.08$ meV (nearest-neighbors only) or $J_1 = -4.77 \pm 0.08$ meV and $J_2 = -0.21 \pm 0.03$ meV lead to excellent fits for most branches at both low and high energies. An additional branch associated with the hidden antiferromagnetic order was observed. This work paves the way for studies of other materials in this class containing spin reorientation transitions and magnetic rare earth ions.

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