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Stacking the Collinear Magnetic Phases of the Geometrically-Frustrated Antiferromagnet $CuFeO_2$ RANDY FISHMAN, FENG YE, JAIME FERNANDEZ-BACA, Oak Ridge National Laboratory — The correct stacking of hexagonal layers is used to obtain accurate estimates for the exchange and anisotropy parameters of the geometrically-frustrated antiferromagnet $CuFeO_2$. Those parameters are highly constrained by the stability of a collinear metamagnetic phase between fields of 13.5 and 20 T. Constrained fits of the spin-wave frequencies of the "up up down down" phase below 7 T are used to identify the magnetic unit cell of the metamagnetic "up up up down down" phase, which contains two hexagonal layers and 10 Fe^{3+} spins. The resulting exchange parameters are much smaller than those obtained from an unconstrained fit of the zero-field spin-wave data and successfully describe not only the main branch of spin-wave excitations but also the spin-wave excitations of the two twins in the (H,K,0) plane [1]. Research sponsored by the Division of Materials Sciences and Engineering, U.S. Department of Energy under contract with UT-Battelle, LLC.
[1] R.S. Fishman, F. Ye, J.A. Fernandez-Baca, J.T. Haraldsen, and T. Kimura, *Phys. Rev. B* **78**, 140407 (2008).

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