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Spin flop transition in the multiferroic $Mn_{1-x}Co_xWO_4$ studied by neutron diffraction FENG YE, SONGXUE CHI, HUIBO CAO, JAIME FERNANDEZ-BACA, Oak Ridge National Laboratory, BERND LORENZ, YAQI WANG, P.W. CHU, University of Houston — Elastic neutron diffraction is employed to investigate the ground state magnetic structure of the multiferroic $Mn_{1-x}Co_xWO_4$. Unlike the undoped $MnWO_4$that has low-T collinear spin structure, the doped $MnWO_4$ exhibits complex evolution of magnetic structure. Samples at lower concentration (x <0.10) have similar elliptical spiral structure as $MnWO_4$ in the multiferroic phase. With increasing x, the magnetic structure undergoes a sudden spin-flop transition which switches electric polarization from crystalline b-axis to a-axis. Polarized neutron scattering is also used to study the correlation between the bulk electricity and magnetic helicity.

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