Magnetic phase transitions in single crystalline \( \text{Mn}_{0.68}\text{Ni}_{0.32}\text{TiO}_3 \) \(^1\) SONGXUE CHI, HUIBO CAO, FENG YE, JAIME A. FERNANDEZ-BACA, Oak Ridge National laboratory, HAIDONG ZHOU, National High Magnetic Field Laboratory, Florida State University — The magnetoelectric MnTiO\(_3\) has the ilmenite structure and order antiferromagnetically with neighboring Mn\(^{2+}\) spins antiparallel to each other both within the ab-plane and along the c-axis. We have observed a magnetic field induced electric polarization in the 32\%Ni-doped MnTiO\(_3\). To understand the origin of this magnetoelectric effect, we have carried out neutron diffraction study on single crystalline \( \text{Mn}_{0.68}\text{Ni}_{0.32}\text{TiO}_3 \). The Mn\(^{2+}\) spins order below 27 K and arrange in the same antiparallel manner as the parent compound, but with different spin direction. On cooling the magnetic phase goes through a second transition at 15 K, below which the spins lock into a new direction. We have also determined the spin structure under a magnetic field applied along the c-axis.

\(^1\)This work was partially supported by the Division of Scientific User Facilities of the Office of Basic Energy Sciences, U.S. Department of Energy.