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**Magnetic field effect on the magnetic structure of $Ba_2CoGe_2O_7$**

C.R. DELA CRUZ, S. LI, Dept. of Physics and Astronomy, Univ. of Tennessee, Knoxville, S.-W. CHEONG, RCEM and Rutgers University, Piscataway, NJ, Y. CHEN, J. LYNN, NIST-NCNR Gaithersberg,MD, H. MOOK, Neutron Scattering Science Division, ORNL, Oak Ridge,TN, P. DAI[1], Dept. of Physics, Univ. of Tennessee — Multiferroic materials have recently attracted much interest fueled by the discovery of the coexistence and mutual interference of long range magnetic and ferroelectric order in them. Further attention to these compounds is gained due to their potential for device applications made possible by the controllability of the spontaneous polarization by a magnetic field or the bulk magnetization by an electric field via the sizable magneto-dielectric coupling in them. The fundamental microscopic mechanism for the phenomena is yet to be fully understood but an essential component has been suggested to be the non-linear coupling of the ferroelectric and magnetic order parameters with a spatially varying magnetization. It is thus the focus of this work to study the static magnetic structure of the compound $Ba_2CoGe_2O_7$ below its magnetic and ferroelectric ordering temperature of 7K. Neutron diffraction measurements were done on the compound under applied magnetic fields up to 7 T along the crystal's $c$-axis.

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