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Neutron Scattering in Multiferroics $Ba_2CoGe_2O_7$ MINORU SODA, TAKATSUGU MASUDA, Institute for Solid State Physics, University of Tokyo, MASASHIGE MATSUMOTO, Department of Physics, Shizuoka University, SEVERIAN GVASALIYA, MARTIN MANSSON, ANDREY ZHELUDEV, Laboratory for Solid State Physics, ETH Zurich — $Ba_2CoGe_2O_7$ having the noncentrosymmetric crystal structure shows a staggered antiferromagnetic structure in the (001) plane below T_N=6.7 K. In the magnetically ordered state, a ferroelectric polarization is observed even at a magnetic field H=0, and largely enhanced under H. In $Ba_2CoGe_2O_7$, Murakawa and co-workers have shown that the ferroelectricity is induced by the spin-dependent *d-p* hybridization mechanism. Furthermore, the 4 meV excitation, which is an electric-active mode through the coupling between spin and electric-dipole, was observed in the electromagnetic wave absorption. In the present study, the neutron scattering measurements were carried out in $Ba_2CoGe_2O_7$ under the magnetic field. We found one acoustic and two optical modes in zero field, which are reasonably reproduced by the extended spin wave theory. Furthermore, our result indicates that the anisotropy of the magnetic moments also connects with the multiferroic property of $Ba_2CoGe_2O_7$.

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