Abstract Submitted
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Magnetoelectric resonance in S=3/2 two-dimensional antiferromagnet $Ba_2CoGe_2O_7$ SHIN MIYAHARA, Multiferroics Project (MF), ERATO, Japan Science and Technology Agency (JST), NOBUO FURUKAWA, Aoyama Gakuin University — We have investigated dynamical magnetoelectric effects in S = 3/2 two-dimensional antiferromagnet $Ba_2CoGe_2O_7$. It is a quasi two-dimensional antiferromagnet. Below T_N = 6.7 K, the Co magnetic moments show an antiferromagnetic ordering [1]. Recently, the material is paid attention to due to the magnetic field induced ferroelectric polarization [2,3]. Such multiferroics behaviors can be explained well by considering a spin-dependent metal-ligand hybridization mechanism on a Heisenberg model with strong uniaxial anisotropy term [3,4]. Through the spin dependent polarization, electric component of light can modulate the spin structures. As a result, electric component of light can excite magnetic excitations. We can clarify selection rules and resonance peak positions in absorption. When both magnetic and electric components induce the same magnetic excitation, cross correlated term, where electric component induced excitation is deduced to the ground state by magnetic component and vice versa, is realized. The effects of such cross correlation can be observed directly as linear directional dichroism in absorption process.[1] A. Zheludev *et al.*, Phys. Rev. B **68** 024428 (2003). [2] H.T. Yi *et al.*, Appl. Phys. Lett. **92** 212904 (2008). [3] H. Murakawa et al., Phys. Rev. Lett. **105** 137202 (2010). [4] T. Arima, J. Phys. Soc. Jpn. **76** 073702 (2007).

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