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**Magnetoelectric Coupling and Relaxation in Yttrium Iron Garnet** YUICHI YAMASAKI, YUKI KOHARA, University of Tokyo, YOSHINORI TOKURA, University of Tokyo, ERATO-JST, and RIKEN — We report the results of the magnetic and dielectric relaxation measurement on yttrium iron garnet  $\text{Y}_3\text{Fe}_5\text{O}_{12}$  which shows the 2nd order magneto-electric (ME) effect under an applied electric field [1] and the 1st order ME effect by an electric field cooling procedure [2]. We found that the temperature dependence of the dielectric relaxation dynamics coincides with that of magnetic one. This suggests a strong magneto-electric coupling between dielectric and magnetic relaxation dynamics. Indeed the dielectric relaxation strengths are enhanced by an applied magnetic field; namely the amplitude of electric dipole moment can be tuned by magnetic field. This effect accounts for the magnetic field induced change of the static dielectric permittivity and thereby the gigantic 2nd order ME effect as observed. [1] T.H. O'Dell, *Phil. Mag.* 16, 487 (1967), [2] H. Ogawa et al., *JPSJ* 56, 452 (1987).

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