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Magnetic Field Induced Shifts of the Spin Rotation Phase Transition of $\text{GdFe}_3(\text{BO}_3)_4$ FEI YEN, BERND LORENZ, Department of Physics and TCSAM, University of Houston, A.N. VASILIEV, Faculty of Physics, Moscow State University, Moscow, 119992 Russia, L.N. BEZMATERNYKH, Kirensky Institute of Physics, Siberian Division, Russian Academy of Sciences, Krasnoyarsk, 660036 Russia, C.W. CHU¹, Department of Physics and TCSAM, University of Houston — $\text{GdFe}_3(\text{BO}_3)_4$ exhibits a structural phase transition at 156 K, antiferromagnetic order of the Fe moments at 36 K followed by a spin reorientation transition at $T_{SR} = 9$ K. At the lower transition the dielectric constant of $\text{GdFe}_3(\text{BO}_3)_4$ shows a distinct peak indicating an interesting coupling between the magnetic order and the dielectric properties. We study thoroughly this lower temperature phase transition through dielectric, magnetic and thermodynamic measurements under the application of external magnetic fields up to 1 Tesla. The spin reorientation transition is shown to split into two phase transitions under external magnetic fields. The dielectric constant at low temperature changes with the applied field and a magneto-dielectric effect of up to 1% is observed at 8 K and 0.7 Tesla.

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