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Anisotropy in the magnetodielectric constant in orthorhombic HoMnO3 thin film SUNG HO LEE, BONG YEOL LEE, MIN HWA JUNG, YOON HEE JEONG, Pohang university of Science and Technology, Pohang, Korea — Epitaxial $HoMnO_3$ thin films in the metastable orthorhombic structure were successfully synthesized on $SrTiO_3$ substrates by pulsed laser deposition. The crystal structure, surface roughness, and surface morphology of the films were characterized by various tools such as X-ray diffraction, atomic force microscopy, scanning electron microscopy etc.. Macroscopic physical properties were measured with a Quantum Design PPMS. It is found that an significant increase of the dielectric constant accompanies the onset of magnetic order at 45 K in the films. This then proves that there exists a magnetodielectric coupling in orthorhombic $HoMnO_3$. Anisotropy in the magnetodielectric constant was observed according to the direction for an external magnetic field. These behaviors will be compared to the cases of $YMnO_3$ and $BiMnO_3$. Measurements of the reverse effect, that is, the variation of the magnetic susceptibility with an electric field, are being attempted.

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