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Magnetic Anisotropy in Epitaxial SrRuO₃ and Ba_{0.5}Sr_{0.5}RuO₃ on (001) SrTiO₃ substrates XIANGLIN KE, KYOUNG-JIN CHOI, CHANG-BEOM EOM, University of Wisconsin-Madison, Madison, WI 53706, MARK RZCHOWSKI — Epitaxial thin films exhibit quite different properties from the corresponding bulk materials due to strain induced by the substrate. For instance, a bulk SrRuO₃ (SRO) single crystal, has a Curie temperature near 160K with two magnetic easy axis. However, there shows uniaxial magnetic anisotropy in single domain epitaxial SRO grown on SrTiO₃ (STO) substrate[1]. In this study, we have grown epitaxial SRO and Ba_{0.5}Sr_{0.5}RuO₃ (BSRO) on 4° miscut (001) STO substrates using pulsed laser deposition (PLD) with in-situ high pressure reflection high energy electron-diffraction (RHEED). Through detailed X-ray diffraction, magnetization and angle-dependent magneto-transport measurements, we explore the magnetic properties of SRO and BSRO. However, in contrast to non-magnetic properties of bulk BSRO and uniaxial anisotropy in SRO film, BSRO film shows ferromagnetism with T_c about 140K and non-uniaxial properties. We discuss the mechanism in terms of lattice distortion due to strain effect and spin-orbit coupling. 1] Q. Gan, R. A. Rao, C. B. Eom, L. Wu, and F. Tsui, J. Appl. Phys. **85**, 5297 (1999).

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