

Abstract Submitted
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Magnetic and structural properties of BiFeO₃ thin films grown epitaxially on SrTiO₃/Si substrates¹ DANIEL CURRIE, RYAN LAUGHLIN, GOKUL RADHAKRISHNAN, WEERASINGHE PRIYANTHA, ROCIO CONTRERAS-GUERERRO, RAVINDRANATH DROOPAD, NIKOLETA THEODOROPOULOU, Texas State University, San Marcos — Commensurate growth of SrTiO₃ (STO) on Si using molecular beam epitaxy (MBE) has been achieved. STO on Si is used as a virtual substrate to enable the growth of BiFeO₃ (BFO). Having a crystalline oxide surface on Si is an enabler for deposition of various functional oxides that would not have been possible directly on silicon. A systematic study of the dependence of the magnetic and structural properties of BFO on the growth conditions, such as O₂ plasma pressure and film thickness, is performed. The crystalline nature of the BFO film has been confirmed by X-Ray diffraction showing the expected peak positions for (100) oriented oxide films with no additional, unidentified peaks. The BFO/STO/Si films exhibit antiferromagnetic behavior with high transition temperatures, thus leading to the possibility of room temperature magnetoelectric coupling-based devices integrated onto Si CMOS circuitry. Thinner films at lower O₂ plasma pressures exhibit stronger magnetic characteristics.

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