

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Electrical and Magnetic Properties of PbTiO₃/SrRuO₃ superlattices¹ HSIANG-CHUN HSING, SARA CALLORI, JUDITH GABEL, SIMON DIVILOV, PIRANAVAN KUMARAVADIVEL, XU DU, MARIVI FERNÁNDEZ-SERRA, MATTHEW DAWBER, Stony Brook University — Theoretical calculations on PbTiO₃/SrRuO₃ (PTO/SRO) superlattices suggest that the SRO layer should retain metallic character even when their thickness is only a single unit cell. They further suggest that when the SRO layer is 2 unit cells or thicker there is coupling between spin and the electric polarization. Here we report on the electrical transport properties of PTO/SRO superlattices, which were fabricated using off-axis RF magnetron sputtering. In the out of plane direction, the samples demonstrate ferroelectricity and tunneling current characteristics that confirm the metallicity of the SrRuO₃ layers. We also studied the impact of the compositionally broken inversion symmetry and magnetic field on the capacitance-voltage characteristic of our superlattices. Changes in the dielectric constant were induced by the application of magnetic field at low temperatures.

¹This work was funded by NSF DMR1334867.

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Date submitted: 13 Nov 2014

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