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Tuning the physical properties in strontium iridate heterostructures JOHN NICHOLS, TRICIA MEYER, HO NYUNG LEE, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA — Strontium iridate ($Sr_{n+1}Ir_nO_{3n+1}$) has received lots of attention recently for its potential to reveal novel physical phenomena due to strong spin-orbital coupling with an interaction energy comparable to that of the on-site Coulomb interaction and crystal field splitting. The coexistence of fundamental interactions has created an exotic $J_{eff} = 1/2$ antiferromagnetic insulating ground state in Sr_2IrO_4. In particular, it is known that this system can be driven into a metallic state with the simultaneous increase in dimensionality (n) and strain. We have investigated the effects of electron confinement by interfacing strontium iridates with other perovskite oxides. We have synthesized thin film heterostructures, $SrIrO_3/AMO_3$ (A = Sr, La; B= Ti, Mn, Rh), layer-by-layer with pulsed laser deposition equipped with reflection high-energy electron diffraction. Based on investigations with x-ray diffraction, *dc* transport, SQUID magnetometry, and various spectroscopic measurements, we will present that the physical properties of the heterostructures are strongly dependent on spatial confinement and epitaxial strain. *This work was supported by the U. S. Department of Energy, Office of Science, Basic Energy Sciences, Materials Science and Engineering Division.

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