**Interface Magnetism, Carrier Confinement, and Magneto-resistance in Nanoscale $CaMnO_3/CaRuO_3$ Superlattices**

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Understanding the spin-dependent scattering of carriers in heterostructures offers remarkable opportunities to expand our knowledge of fundamental properties of materials as well as presenting new pathways to new technologies. In the past, nanometer scale structures of conventional metallic multilayers have lead to the discovery of profound spin-dependent effects known as giant magneto-resistance. Recent achievements in high-quality growth of complex oxide materials has opened a passage to rationally explore the effects of nanoscale confinement of strongly correlated electrons. Here we present a detailed microscopic study of the electronic and magnetic properties of interface states in superlattices composed of an antiferromagnetic insulator $CaMnO_3$ (CMO) and a paramagnetic metal $CaRuO_3$ (CRO). The confinement of carriers inside the CRO layer leads to a non-trivial localization phenomena accompanied by a large magneto-resistance effect in the nominally non-ferromagnetic heterostructure. Through a combination of advanced probe techniques, we find that the magneto-resistance is connected to a canted spin state in the anti-ferromagnet formed due to the charge leakage at the interface.

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