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Effects of structural phase transitions on the interface of perovskite oxides[1] NICHOLAS J. GOBLE, Department of Physics, Case Western Reserve University, RICHARD AKROBETU, ALP SEHIRLIOGLU, Department of Materials Science and Engineering, Case Western Reserve University, THONG Q. NGO, JOHN G. EKERDT, Department of Chemical Engineering, University of Texas at Austin, KRISTY J. KORMONDY, ALEXANDER A. DEMKOV, Department of Physics, University of Texas at Austin, XUAN P.A. GAO, Department of Physics, Case Western Reserve University — Conductivity at the interface of perovskite oxides such as $LaAlO_3/SrTiO_3$ is a wildly growing area of research. These interfaces are rich in phenomena including superconductivity, large negative in-plane magnetoresistance, giant persistent photoconductivity, and ferromagnetism. Although this field has seen rapid growth in the recent decade, there is yet to be a systematic study on what effect structural phase transitions in strontium titanate play on the interface. It is well understood that strontium titanate transitions from a cubic to tetragonal phase most notably at 105K, but how this effects oxide interface conductivity has yet to be reported on. Through transport measurements, we observe evidence of structural phase transitions in LaAlO3/SrTiO3 and Al2O3/SrTiO3 interfaces at 80K and 200K. These effects are enhanced when the scale of the devices is reduced to a few microns.

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