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Investigation of Current Channels at the Interface between Complex Oxide Heterostructures AARON ROSENBERG, JOHN KIRTLEY, ERIC SPANTON, CHRISTOPHER WATSON, EMILIANO DI GENNARO, Stanford University, UMBERTO SCOTTI DI UCCIO, CARMELA ARUTA, FRANCESCO TAFURI, FABIO MILETTO GRANOZIO, CNR-SPIN, KATHRYN MOLER, Stanford University — The interface between $SrTiO_3$ and $LaAlO_3$, both perovskite oxide insulators, supports metallic and superconducting states under certain conditions. Previous unpublished data by Kalisky et al. shows spatial variation in the current flow in these interfaces, including enhanced conductivity associated with structural domains. The microscopic origin of this variation in conductivity is unknown. We extend the previous work to $LaGaO_3/SrTiO_3$, and $NdGaO_3/SrTiO_3$ interfaces, observe similar stripe-like modulations in the current flow, and study their temperature and frequency dependence. Additionally, we plan to study how the current channels in $LaAlO_3/SrTiO_3$ change under a uniaxial strain. Investigation of these spatial variations may improve our understanding of the relationship between structure and conductivity in complex oxide interfaces.

Aaron Rosenberg
Stanford University

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