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**Hysteretic magneto-resistance at the LaAlO<sub>3</sub>-SrTiO<sub>3</sub> interface  
- interplay between superconducting and ferromagnetic properties<sup>1</sup>**

MANAN MEHTA, DIMITRY DIKIN, Northwestern University, CHUNG WUNG BARK, CHAD FOLKMAN, CHANG-BEOM EOM, University of Wisconsin-Madison, VENKAT CHANDRASEKHAR, Northwestern University — The conducting interface formed between LaAlO<sub>3</sub> (LAO) and SrTiO<sub>3</sub> (STO) has been shown to have both magnetic and superconducting properties. The behaviour can be tuned from one to the other by changing the applied gate voltage, thus changing the density of carriers at the interface. We will present magneto-transport data on a Hall-bar geometry patterned LAO/STO interface, with 10 unit cells LAO thickness. The longitudinal magneto-resistance shows strong hysteretic behaviour, indicating a ferromagnetic state, at negative gate voltages; the transverse magneto-resistance being linear. However, the hysteresis survives even into the superconducting state, and also shows up in the transverse magneto-resistance. This suggests an interplay between the superconducting and ferromagnetic order parameters of this system.

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