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Low Temperature Transport of $LaAlO_3/SrTiO_3$ interfaces STEFANO GARIGLIO, ALEXANDRE FETE, DANFENG LI, DANIELA STORNAIUOLO, JEAN-MARC TRISCONE, DPMC, University of Geneva — The conducting interface between the two band insulators $LaAlO_3$ and $SrTiO_3$ has drawn a large share of attention, as it presents a variety of exciting electronic properties that are tunable by an electric field [1]. At low temperatures, magnetotransport analysis has revealed a strong Rashba spin-orbit interaction originating from the breaking of inversion symmetry [2] and, in field effect devices, the ground state has been tuned from an insulating to a superconducting state. I will discuss these results in light of recent magnetotransport experiments in field-effect devices to probe the evolution across the phase diagram of the weak localization /weak anti-localization transport regime, its relation to the strength and anisotropy of the superconducting state.

[1] A. D. Caviglia *et al.*, Nature **456**, 624 (2008).
[2] A. D. Caviglia *et al.*, Phys. Rev. Lett. **104**, 126803 (2010); A. Fête *et al.*, Phys. Rev. B **86**, 201105 (2012).

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