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**Spin injection and spin-charge conversion in $LaAlO_3/SrTiO_3$**[1]
MANUEL BIBES, EDOUARD LESNE, JUAN CARLOS ROJAS SANCHEZ, CNRS/Thales, SIMON OYARZUN, YU FU, Institut Nanosciences et Cryogénie, CEA & Université Grenoble Alpes, NICOLAS REYREN, CNRS/Thales, MATHIEU JAMET, Institut Nanosciences et Cryogénie, CEA & Université Grenoble Alpes, ERIC JACQUET, AGNES BARTHELEMY, JEAN-MARIE GEORGE, ALBERT FERT, HENRI JAFFRES, CNRS/Thales, LAURENT VILA, Institut Nanosciences et Cryogénie, CEA & Université Grenoble Alpes — The perovskite oxides family provides materials to efficiently generate and control spin polarized currents using respectively half-metallic ferromagnets such as mixed-valence manganites or ferroelectrics and multiferroics. More recently channel materials to transport spin information have also emerged. These include the $LaAlO_3/SrTiO_3$ two-dimensional electron system (2DES) which, in addition, possesses a gate-tunable spin-orbit coupling. A limitation of this system is however the minimum $LaAlO_3$ thickness of 4 uc required for 2DES formation. In this presentation we will show that this thickness can be reduced if the $LaAlO_3$ is capped by appropriate metals. We will also present different approaches to inject spins in these engineered $LaAlO_3/SrTiO_3$ 2DES and introduce detection schemes taking advantage of efficient spin-charge conversion via interfacial spin-orbit effects.

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