

Abstract Submitted
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Electric field modulation of superconductivity and kondo effect in $\text{LaAl}_{1-x}\text{Cr}_x\text{O}_3/\text{SrTiO}_3$ interfaces GYANENDRA SINGH, ALEXIS JOUAN, SIMON HURAND, CHERYL PALMA, LPEM -CNRS-ESPCI ParisTech-UPMC, 10 Rue Vauquelin - 75005 Paris, France, PRAMOD KUMAR, ANJANA DOGRA, RAMESH BUDHANI, National Physical Laboratory, New Delhi 110012, India, JEROME LESUEUR, NICOLAS BERGEAL, LPEM -CNRS-ESPCI ParisTech-UPMC, 10 Rue Vauquelin - 75005 Paris, France — Two dimensional electron gas exhibit superconductivity and spin orbit coupling (SOC) at the interfaces of two insulators $\text{LaXO}_3/\text{SrTiO}_3$ (where X = Al, Ti and Ga) [1-3], whereas no conductivity is seen when X site is replaced by Cr and Mn [4]. We present low temperature measurements of $\text{LaAl}_{1-x}\text{Cr}_x\text{O}_3/\text{SrTiO}_3$ interfaces for Cr doping of $x = 0, 0.1, 0.2$. We show a sharp superconducting transition (T_c) at 175 mK for undoped sample ($x = 0$) which becomes broader for the Cr doping of $x = 0.1$ with T_c of 100 mK. Further Cr doping to $x = 0.2$ indicate no sign of superconductivity. We have analyzed the results with hall carrier density and SOC as a function of Cr doping. The temperature dependent sheet resistance below 50 K display an upturn for $x = 0$ which becomes more pronounced with Cr doping. We discuss the result on the basis of kondo scattering which can be modulated by varying the carrier density.

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