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Tunable Kondo Effect in $SrTiO_3$[1]

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Correlated, low-dimensional systems offer the possibility of tuning complex physical phenomena. Using strong electric fields applied with an electrolytic gate, we continuously tune through three regimes of transport in $SrTiO_3$: an insulator, a metal and a Kondo metal. Two of these regimes – the metallic and Kondo metal state – are investigated as a function of temperature and magnetic field, where clear signatures of each regime are evident and discussed. This diverse system not only displays behavior distinct from conventional two-dimensional electron gases, but also show similarities to the $LaAlO_3/SrTiO_3$ interface, elucidating on some of the phenomena observed in this heterostructure of debated origin.

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