Abstract Submitted
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Two-Dimensional Spin-Polarized Electron Gas at the Perovskite Manganite Interface : $SrMnO_3/LaMnO_3$[1] BIRABAR NANDA, Department of Physics University of Missouri, Columbia(MO), SASHI SATPATHY, Department of Physics, University of Missouri, Columbia(MO) — Electronic structure calculations for the perovskite manganite heterostructure $(SrMnO_3)_n/(LaMnO_3)_1/(SrMnO_3)_n$ reveal the presence of a novel spin-polarized electron gas at the interface, generated from the stripped-off La ($5d^1$) electrons, which become confined in the electrostatic V-shaped potential well of the positively charged (LaO) sheet, occupying the Mn(e_g) states near the interface. The presence of these electrons turns the interaction between the interfacial Mn atoms to be ferromagnetic via the Anderson-Hasegawa double exchange, overcoming the original antiferromagnetic superexchange present in the $SrMnO_3$ bulk. The FM Mn atoms at the interface in turn make the electron gas spin-polarized, as confirmed by the total energy calculations, and the type G AFM of the bulk is resumed a few layers into the bulk.

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