

Abstract Submitted
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Strong magnetic interaction in localized two-dimensional electron gas in $\text{LaAlO}_3/\text{SrTiO}_3/\text{NdGaO}_3$ heterostructures¹ Z. HUANG, X. WANG, Z.Q. LIU, W.M. LV, S.W. ZENG, A. ANNADI, W.L. TAN, T. VENKATESAN, - ARIANDO, NUSNNI-NanoCore, National University of Singapore, Singapore — Via reducing the thickness of SrTiO_3 layer, strong localization of two-dimensional electron gas is artificially introduced at $\text{LaAlO}_3/\text{SrTiO}_3$ interface grown on NdGaO_3 (110) substrates. This localization is characterized by the low carrier density, robust insulating ground state and variable range hopping behavior at low temperature. Given the spatially-limited conducting channel in the thin SrTiO_3 layer, the degeneration of Ti 3d orbitals at the interface should be responsible for this strong localization. Moreover, the typical butterfly-like hysteresis loop and unusual anisotropic features in magnetoresistance observed in the thinner SrTiO_3 samples indicate the enhanced magnetic interaction in this strongly localized two-dimensional electron gas.

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