

Abstract Submitted
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Modulating the Conductivity of LaAlO₃/SrTiO₃ interface by Ionic Liquid-assisted Electric Field Effect S.W. ZENG, W.M. LV, Z. HUANG, K. GOPINADHAN, K. HAN, C.J. LI, L.K. JIAN, T. VENKATESAN, ARIANDO ARIANDO, NUSNNI-NanoCore, National University of Singapore — The LaAlO₃/SrTiO₃ (LAO/STO) interface exhibits various novel properties such as conductivity, superconductivity and magnetism, which are not observed in its bulk materials. Modulation of its conductivity could help to understand the origin of such properties and explore potential application. We demonstrate the modulation of electrical transport properties in LAO/STO interface by electric field effect using electric double layer transistor (EDLT) configuration. In initially metallic samples, reversible metallic-insulating phase transition, field-effect transistor operation and electron mobility enhancement were observed in liquid-gated LaAlO₃/SrTiO₃ interface. Due to enhancement of mobility, we can observe quantum oscillations of the conductance at liquid-gated LAO/STO interface.

Ariando Ariando
NUSNNI-NanoCore, National University of Singapore

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