

Electron gas at the interface between two antiferromagnetic insulating manganites

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We study theoretically the magnetic and electric properties of the interface between two antiferromagnetic and insulating manganites: $\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$, a strong correlated insulator, and CaMnO_3 , a band-insulator. We find that a ferromagnetic and metallic electron gas is formed at the interface between the two layers. We confirm the metallic character of the interface by calculating the inplane conductance. The possibility of increasing the electron gas density by selective doping is also discussed.