

Abstract Submitted
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**Quantum confinement in double perovskite multilayers:
 $\text{Sr}_2\text{FeMoO}_6/\text{La}_2\text{CoMnO}_6$** SUBHASIS SAMANTA, BIRABAR NANDA, Indian
Inst of Tech-Madras — We have examined the interfacial electronic structure of
multilayers grown along [001] out of half metallic ferrimagnet $\text{Sr}_2\text{FeMoO}_6$ (SFMO)
and insulating ferromagnet $\text{La}_2\text{CoMnO}_6$ (LCMO) using the density functional the-
ory calculations. The half-metallic nature arises due to the partial occupancy of xz ,
 yz and x^2-y^2 states of SFMO in the spin minority channel. We find that LCMO
provides a confinement potential along z the direction to the spin-polarized free elec-
trons at the interface. The confinement potential ensures further quantization of the
delocalized states, namely xz and yz of SFMO, lying on the Fermi level. The x^2-y^2
states remain unaffected and therefore, spin-polarized two dimensional electron gas
(2DEG) is intrinsically formed. The formation of 2DEG is very distinct from that
of the widely studied LAO/STO and LMO/SMO heterostructures. In these com-
pounds, the 2DEG is formed via interfacial electron reconstruction to quench the
polar catastrophe.

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