Supporting information for

Manipulating Topological Hall-like Signatures by Interface Engineering in Epitaxial Ruthenate/Manganite Heterostructures

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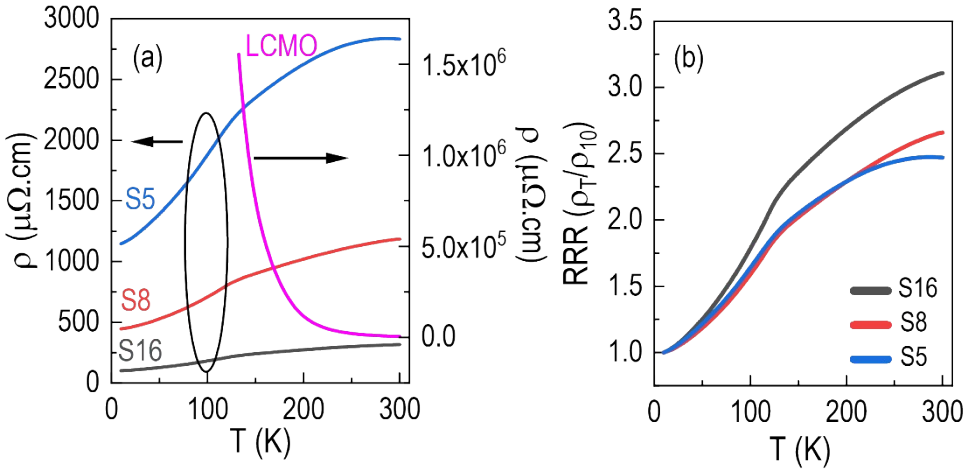

Figure S1: (a) temperature-dependent resistivity of *of SRO/LCMO bilayers with SRO thickness 16 nm, 8 nm and 5 nm (left axis) and pure LCMO (right axis)* (b) corresponding residual resistivity ratio *(RRR).*

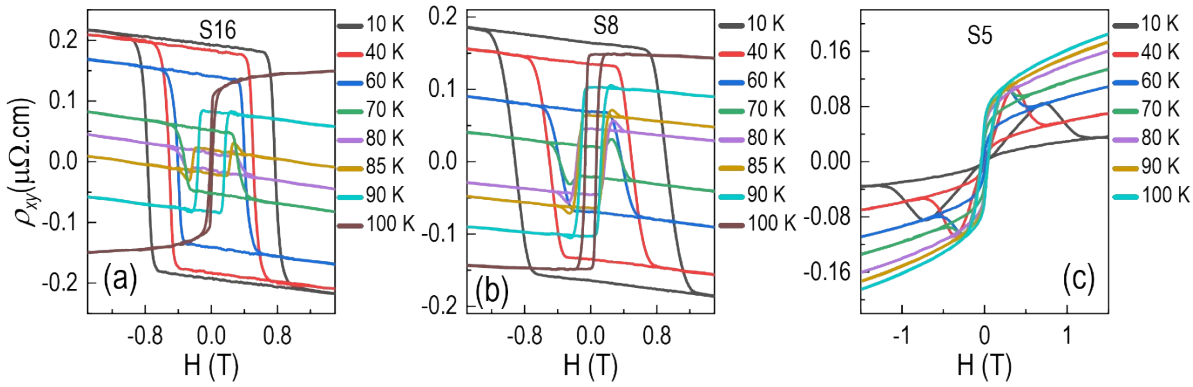

Figure S2: Hall resistivity of (a) S16, (b) S8 and (c) S5 from 10 K to 100 K

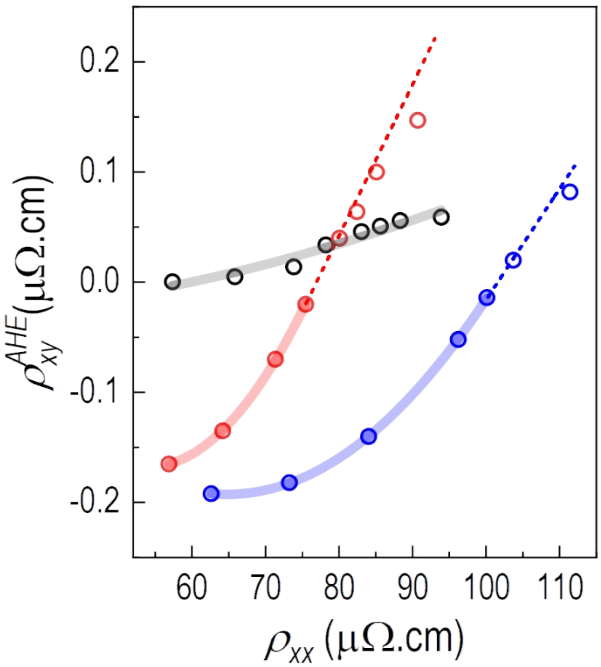

Figure S3: Scaling relation between Hall resistivity (ρ_{xy}) and longitudinal resistivity (ρ_{xx}) has been investigated using the relation $\rho_{xy} = A\,\rho_{xx} + B\,\rho_{xx}^2 + C$, where A, B and C are constants and C represents the residual resistivity due to static impurities at low temperature[1].

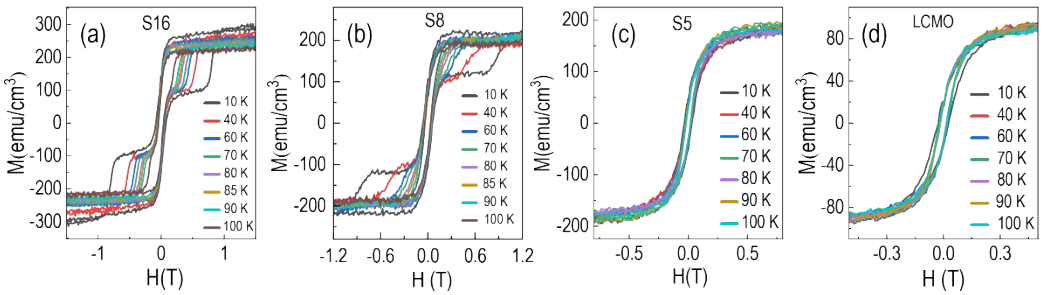

Figure S4: Magnetic hysteresis of (a) S16, (b) S8, (c) S5 and (d) pure LCMO film from 10 K to 100 K

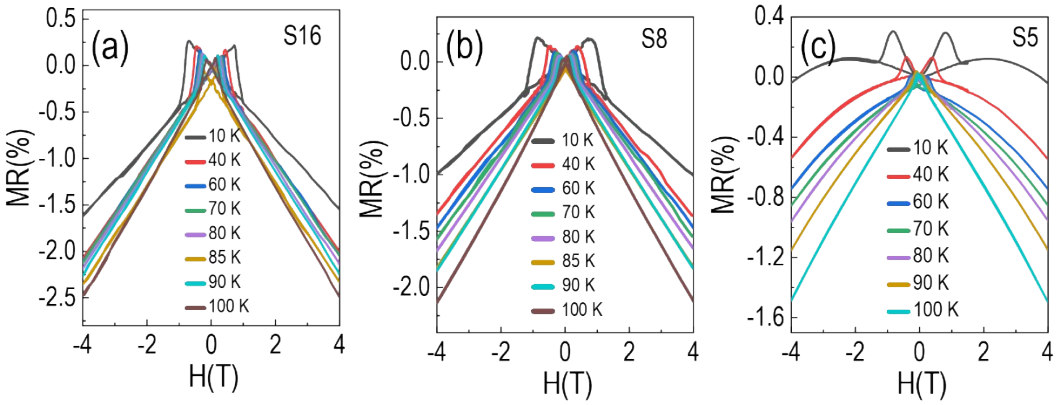

Figure S5: Magnetoresistance of (a) S16, (b) S8 and (c) S5 from 10 K to 100 K

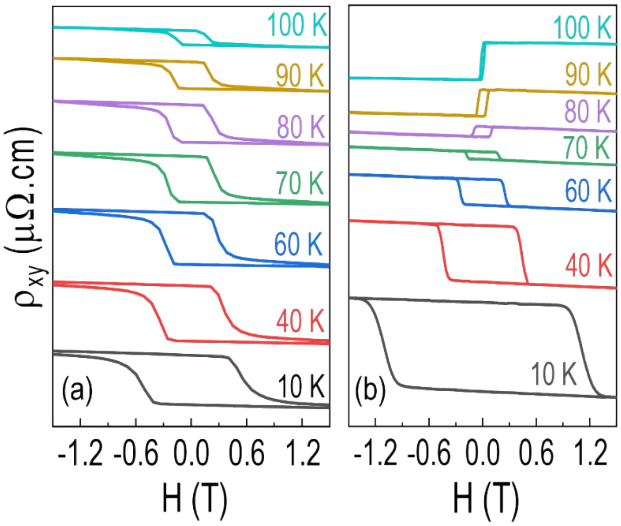

Figure S6: Hall resistivity of single layer SRO films with 16 nm and 5 nm thickness, respectively.

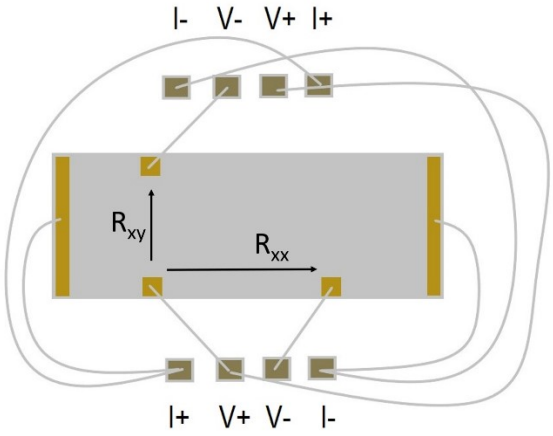

Figure S7: The Hall bar geometry used for the transport measurement.

References:

(1) Hou, D.; Su, G.; Tian, Y.; Jin, X.; Yang, S. A.; Niu, Q. Multivariable Scaling for the Anomalous Hall Effect. *Phys. Rev. Lett.* **2015**, *114* (21), 217203. https://doi.org/10.1103/PhysRevLett.114.217203.