

Supporting Information

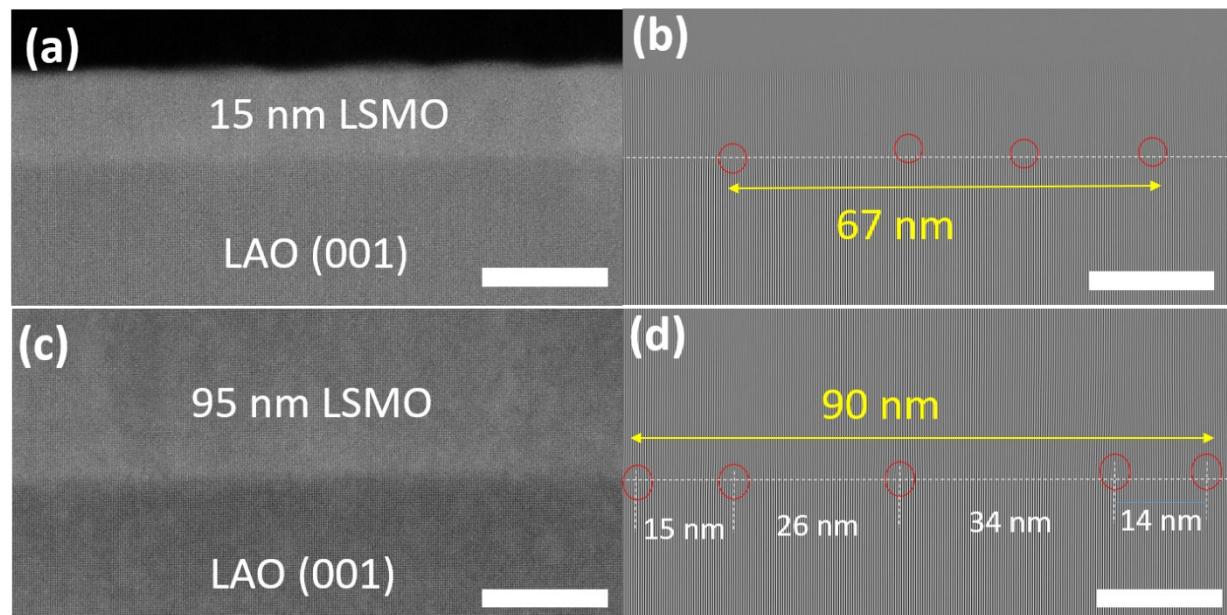


Figure S1. (a) A typical STEM image of the 15 nm LSMO film on LAO (001) and (b) the corresponding FFT image. (c) A typical STEM image of the 95 nm LSMO film on LAO (001) and (d) the corresponding FFT image.

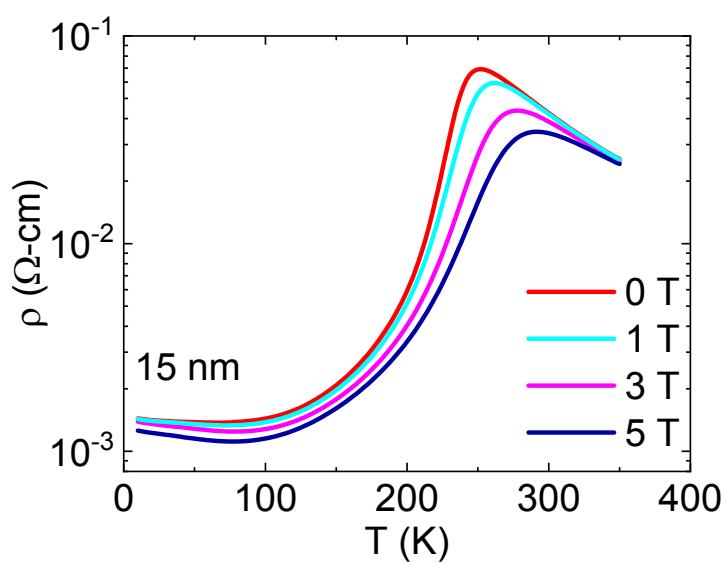


Figure S2. ρ - T curves of the 15 nm film at different magnetic fields.

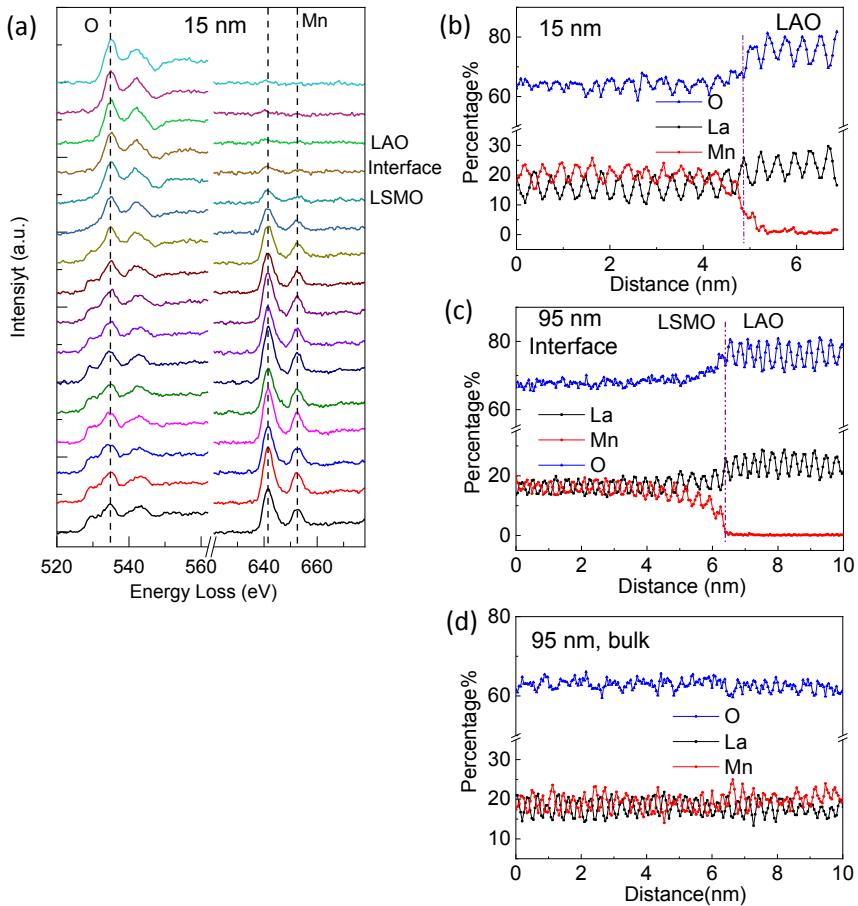


Figure S3. (a) EELS of O K edge and Mn L_{3,2} edge across LSMO-LAO interface for 15 nm sample. The position dependent La, Mn and O atomic ratios in the (b) 15 nm, (c) 95 nm samples (interface) and (d) 95 nm samples (bulk). The La/Mn ratio is estimated by excluding the data collected near the substrate-film interface (2 nm) as Mn deficiency was observed in all samples near the substrate-film interface.