Electronic Supplementary Material (ESI) for Materials Horizons.

Supplementary Materials

for

Tuning Rashba-Dresselhaus effect with ferroelectric polarization at asymmetric hetero-structural interface

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Outline

S1: Crystal structure

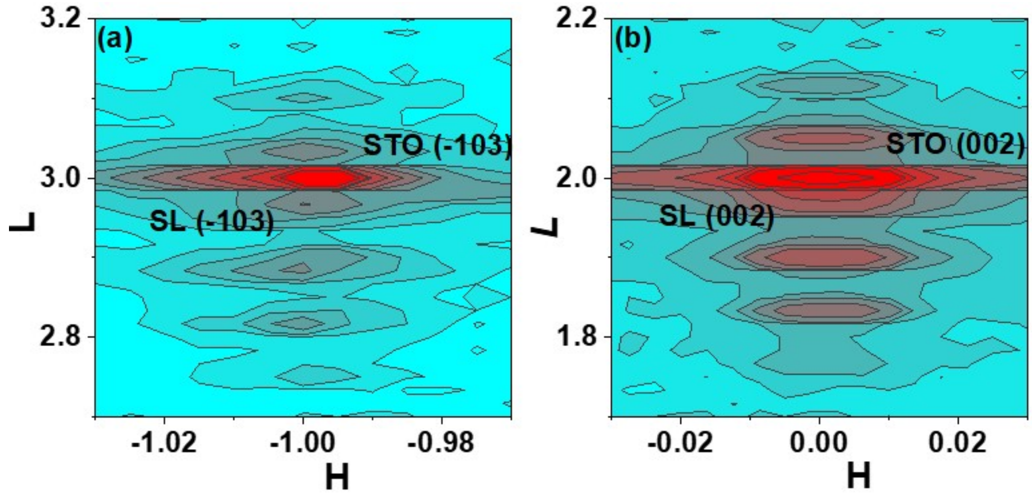

Figure S1: The (002) and (-103) reciprocal space mapping for TiO_2-SL with $t = 5$ unit cells.

S2: Magnetic and transport properties

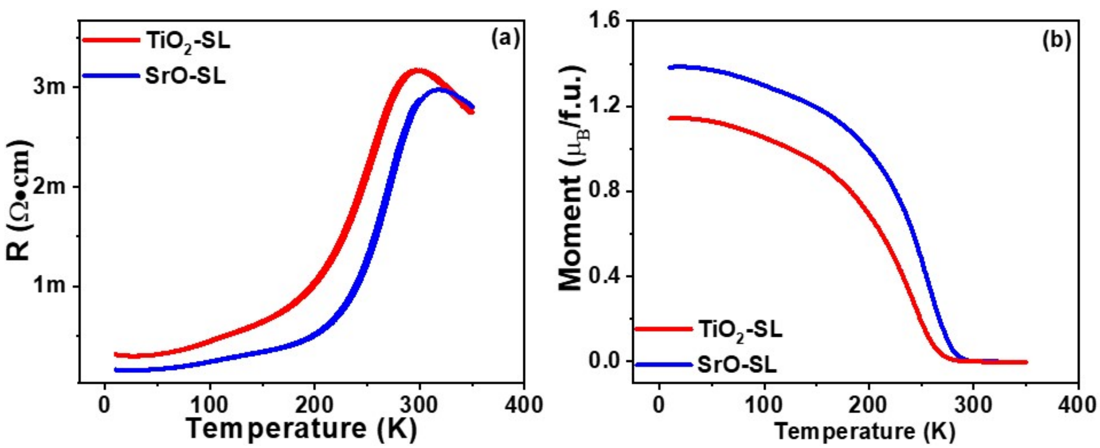

Figure S2: (a) the resistivity-temperature curve and (b) magnetization-temperature curve with in-plane 100 Oe field for TiO_2- and SrO-SL with $t = 5$ unit cells.

S3: AMR fitting for superlattice with BTO t = 5 uc

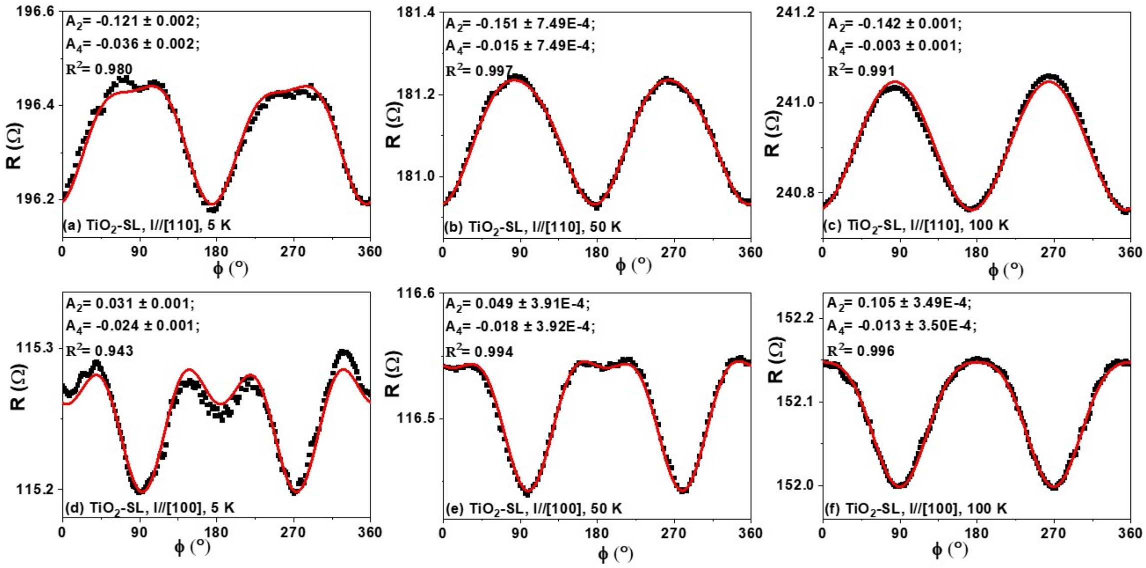

Figure S3-1: the measured AMR and corresponded fitting with I//[110] (a-c) and I//[100] under 9 T at different temperatures for TiO_2 -SL. See detailed discussion in Figure 2 of main text.

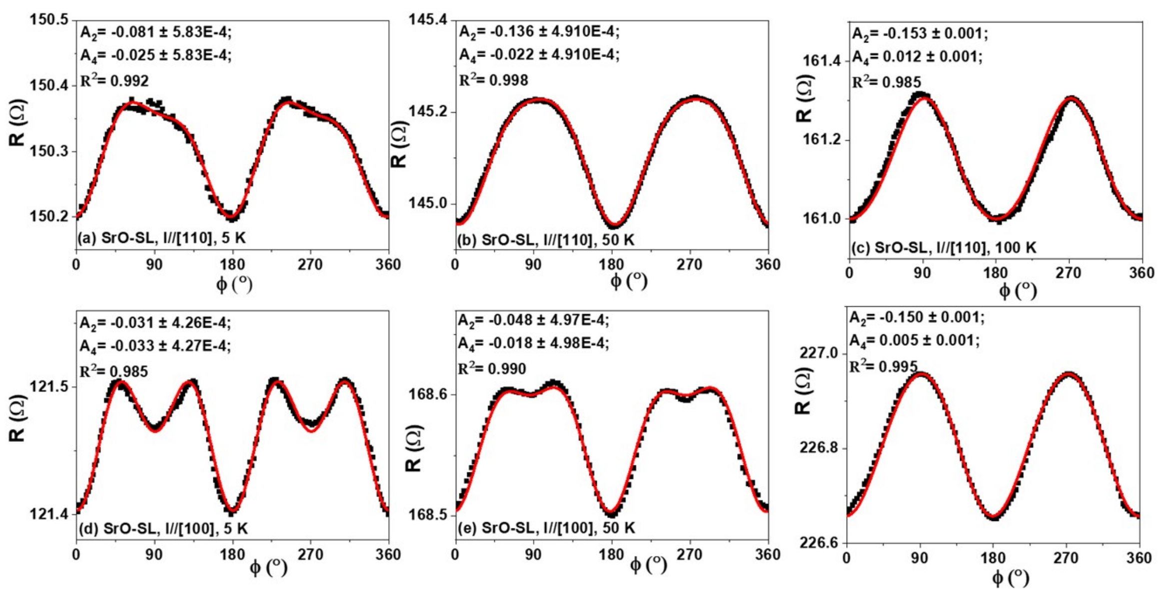

Figure S3-1: the measured AMR and corresponded fitting with I//[110] (a-c) and I//[100] under 9 T at different temperatures for SrO -SL. See detailed discussion in Figure 2 of main text.

S4: EELS for superlattice fabricated at low temperature

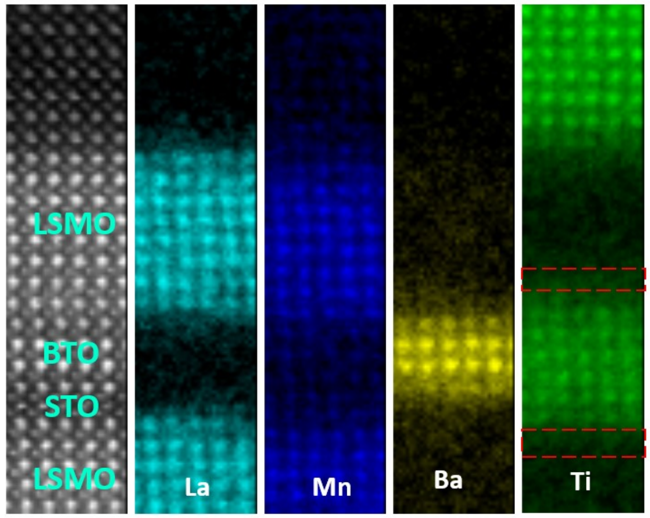

Figure S4: The high-resolution STEM image with EELS for superlattice fabricated at a set point of 850 °C with $t = 5$ unit cells.

S5: Determine the atomic position

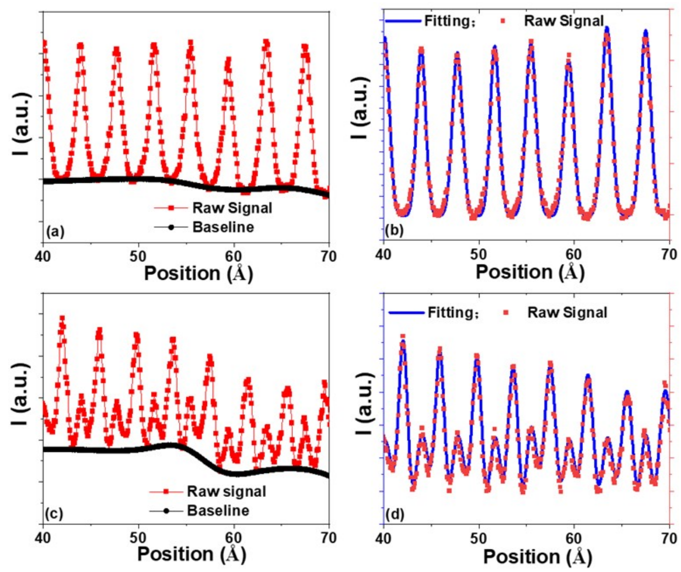

Figure S5-1: The line scan and corresponding data process (a-b) of BO_2 plane to obtain the B site-, and (c-d) of AO plane to obtain the A site-atomic position for SrO-SL.

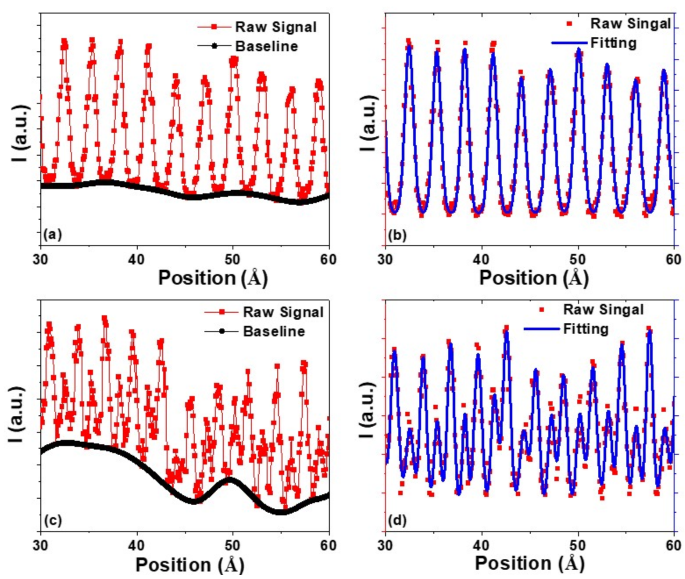

Figure S5-2: The line scan and corresponding data process (a-b) of BO_2 plane to obtain the B site-, and (c-d) of AO plane to obtain the A site-atomic position for TiO_2-SL.

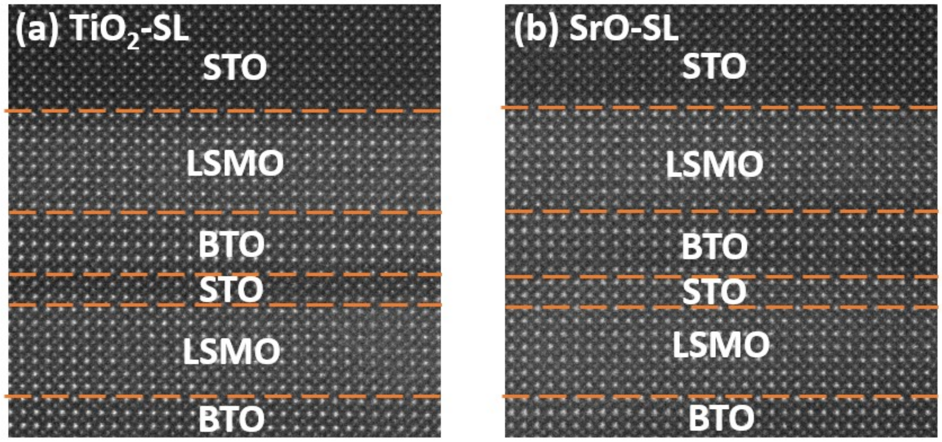

Figure S5-3: The high-resolution STEM image for (a) TiO_2- and (b) SrO-SL with *t* = 5 unit cells.

S6: MH loops

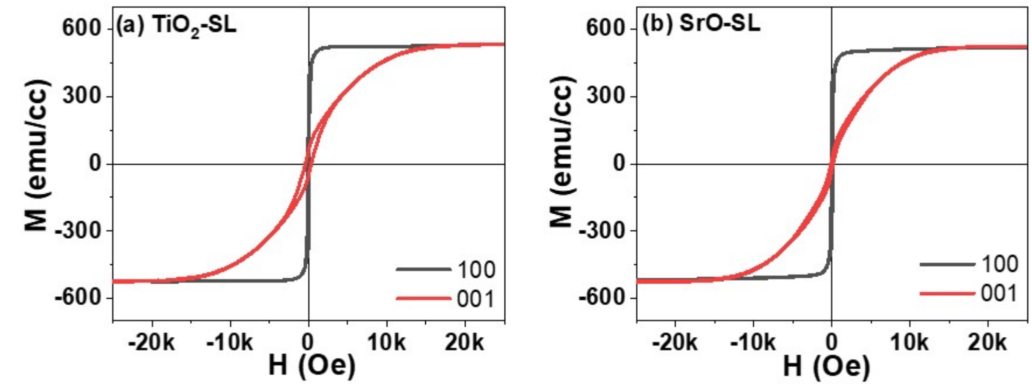

Figure S6: The MH loop for (a) TiO_2- and (b) SrO-SL with t = 5 unit cells at 5 K.

S7: AMR fitting for superlattice with different BTO t

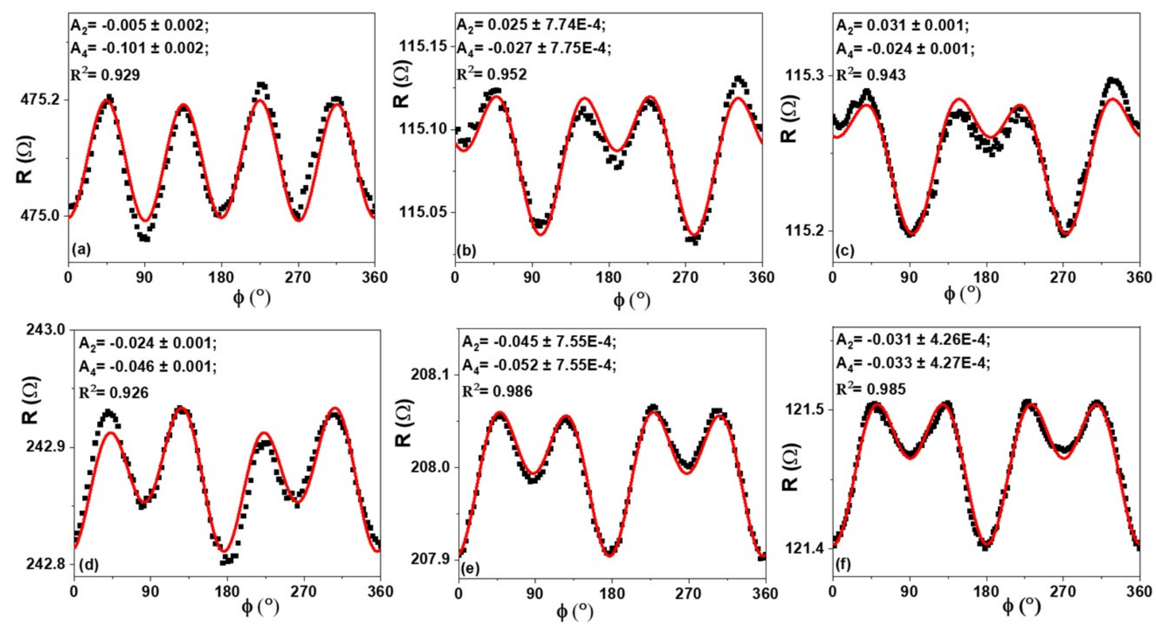

Figure S7: the measured AMR and corresponded fitting with I//[100] under 9 T, 5 K (a-c) for TiO_2 -SL with BTO t = 1 UC, 3 UC and 5 UC, respectively; (d-f) for SrO -SL with BTO t = 1 UC, 3 UC and 5 UC, respectively.