

Supplementary Information

Vertically aligned nanocomposite $(\text{BaTiO}_3)_{0.8}:(\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3)_{0.2}$ thin films
with anisotropic multifunctionalities

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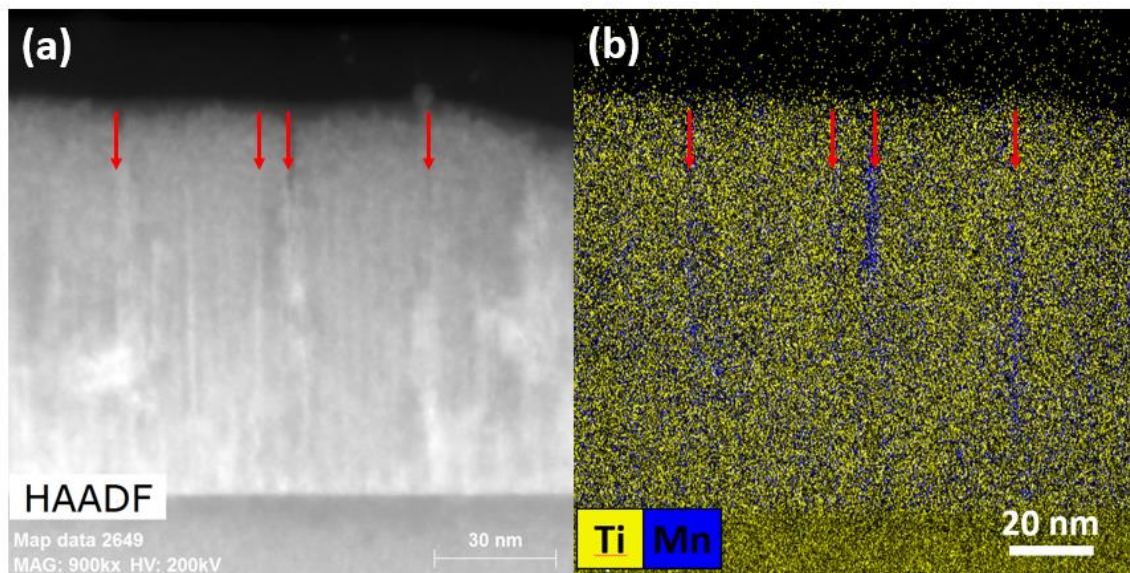


Fig. S1. Cross-sectional (a) HAADF and (b) EDS mapping of the 2 Hz BTO:LSMO thin film. The Ti and Mn atoms are plotted in yellow and blue in the EDS mapping.

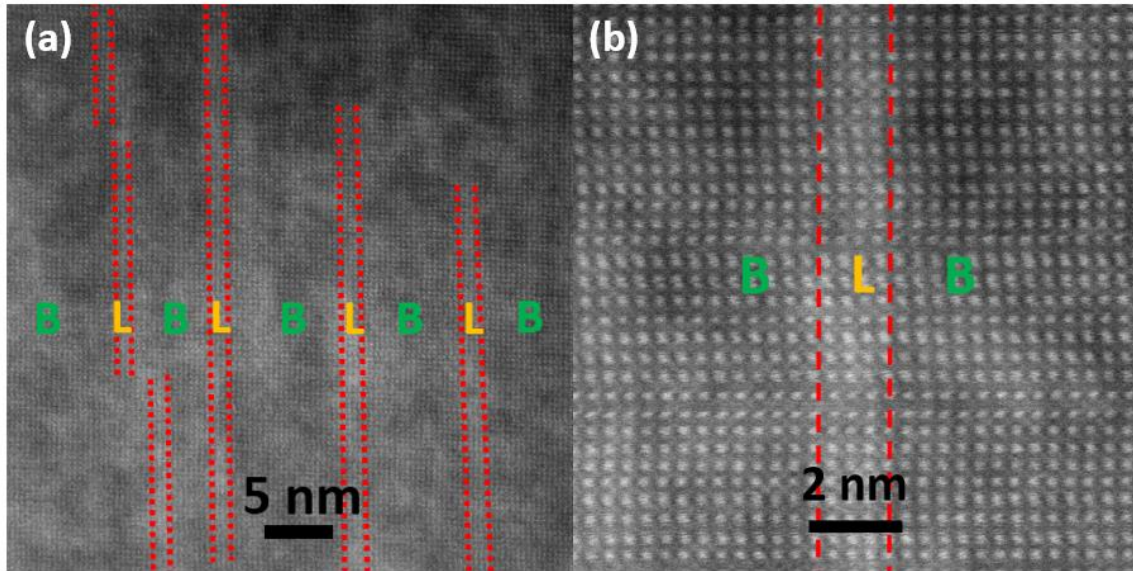


Fig. S2. Cross-sectional (a) STEM and (b) HRSTEM images of the 10 Hz BTO:LSMO thin film. The letters B and L indicate BTO matrix and LSMO pillars, while the red dashed lines indicate the phase boundaries.

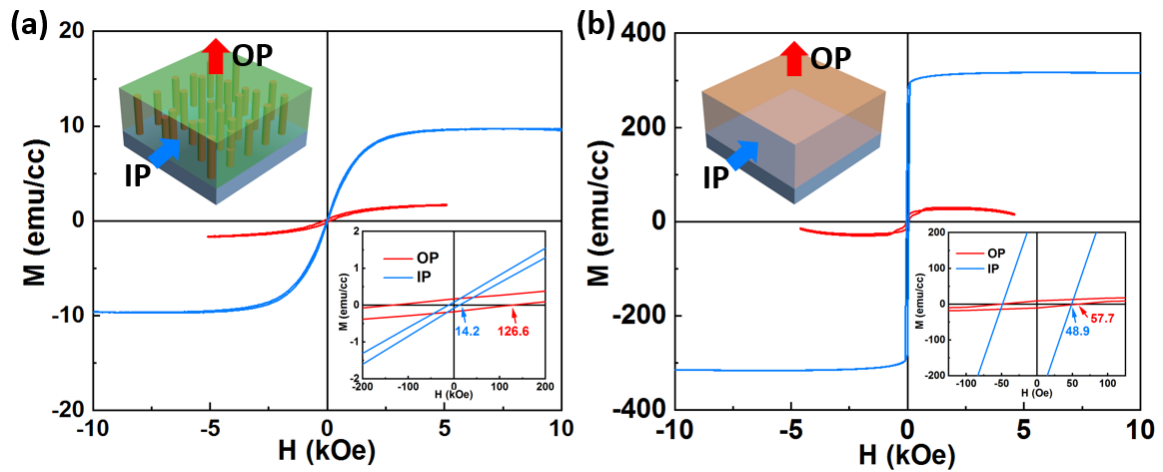


Fig. S3. The room temperature magnetic hysteresis loops of the (a) 10 Hz BTO:LSMO thin film and (b) pure LSMO thin film with the magnetic field applied in both IP and OP directions. The top inset demonstrates the direction of the applied magnetic field and the bottom inset shows the enlarged magnetic hysteresis loops close to the original point.

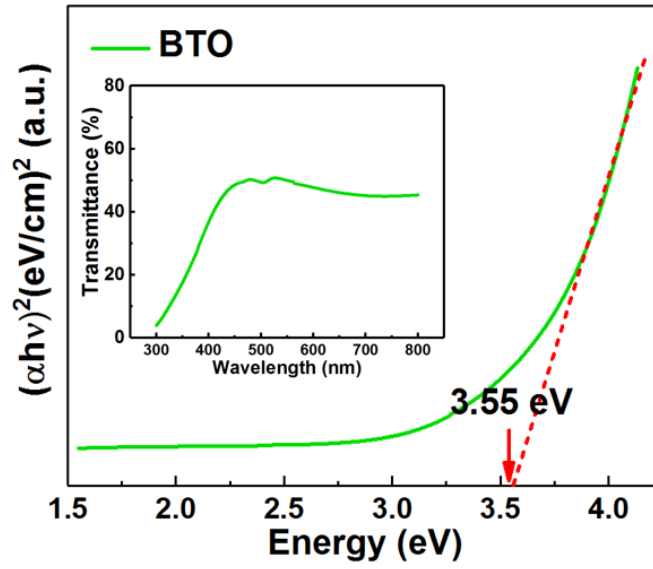


Fig. S4. Direct band gap of the pure BTO thin film. The optical band gap is derived from the transmittance spectrum, as shown in the inset.