

Supplementary Information

Novel layered $\text{Bi}_3\text{MoM}_T\text{O}_9$ ($M_T = \text{Mn, Fe, Co and Ni}$) thin films with tunable multifunctionalities

Xingyao Gao,¹ Leigang Li,¹ Di Zhang,¹ Xuejing Wang,¹ Jie Jian,¹ Zihao He,² and Haiyan Wang^{1,2*}

¹School of Materials Engineering, Purdue University, West Lafayette, IN 47907, United States

²School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN 47907, United States

*To whom correspondence should be addressed: hwang00@purdue.edu

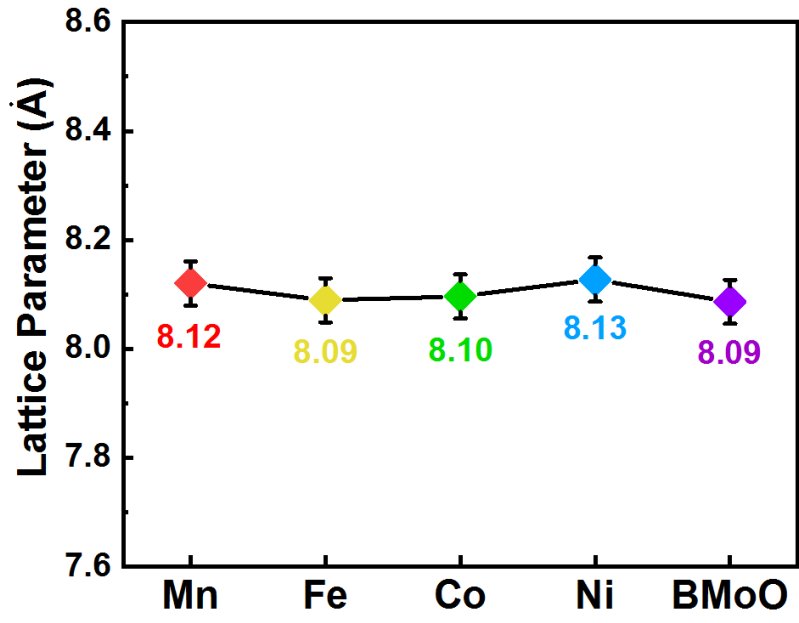


Fig. S1. Out-of-plane lattice parameters of BMoM_TO and BMoO thin films.

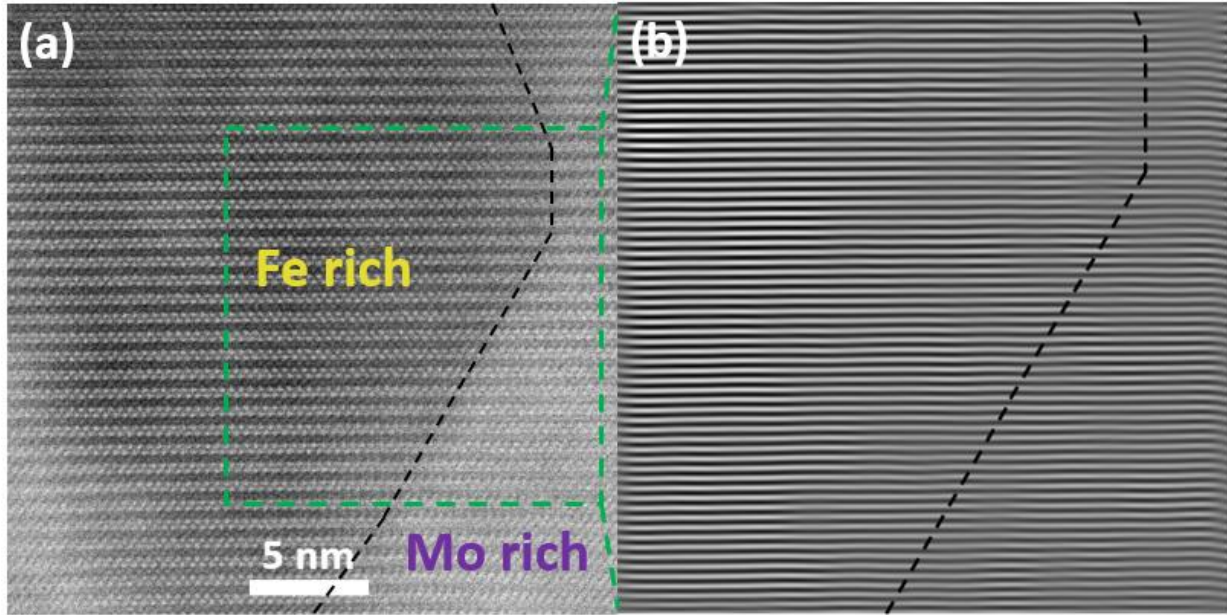


Fig. S2. (a) HRTEM image of the BMoFeO thin film, while the black dashed line indicates the domain boundary. (b) Fast-Fourier transform (FFT) filtered image of the BMoFeO thin film.

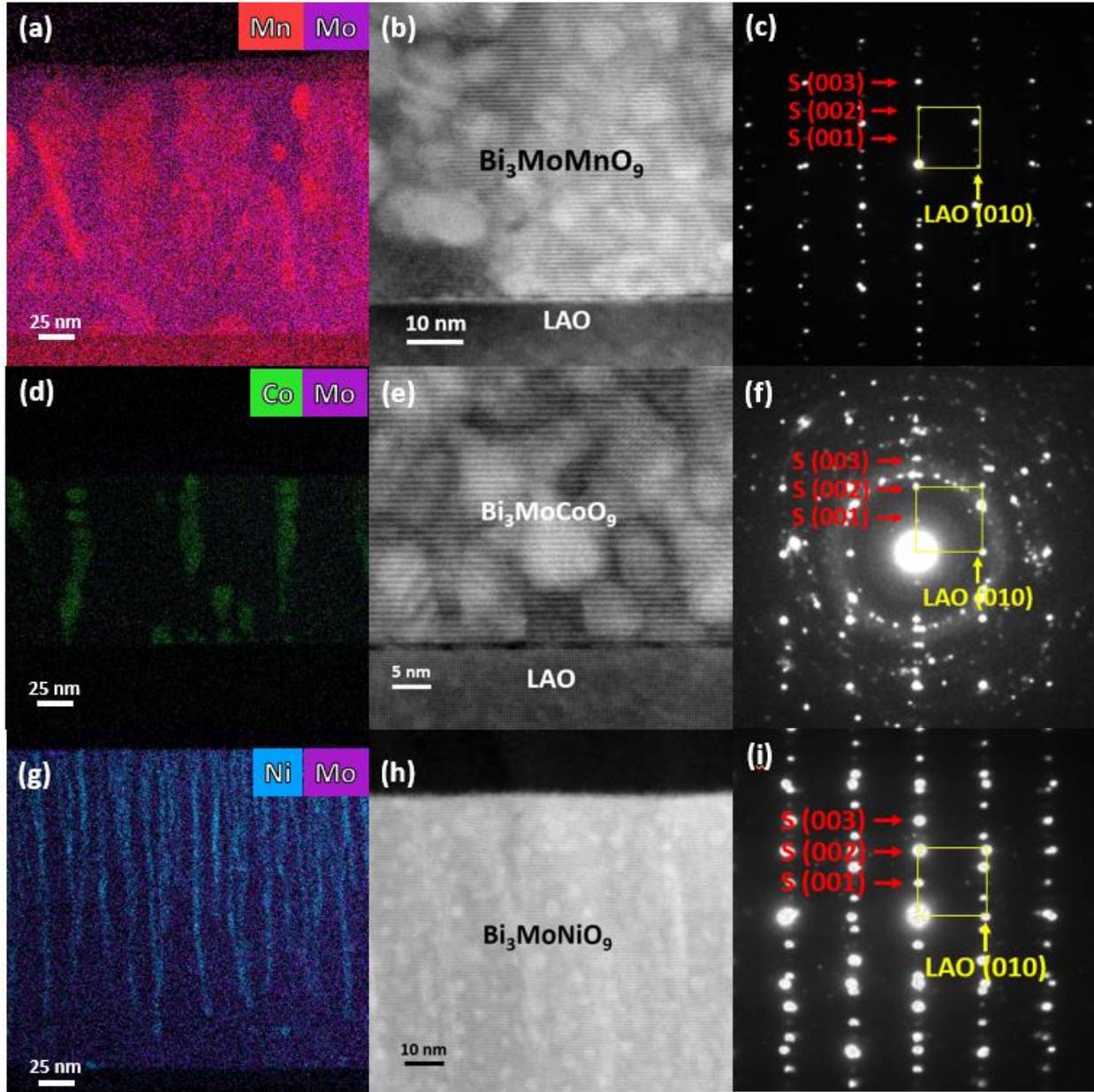


Fig. S3. Cross-sectional energy-dispersive X-ray spectra (EDS) mappings (left); STEM images (middle); and selected area electron diffraction (SAED) patterns (right) of: (a-c) BiMoMnO (d-f) BiMoCoO and (g-i) BiMoNiO thin films.

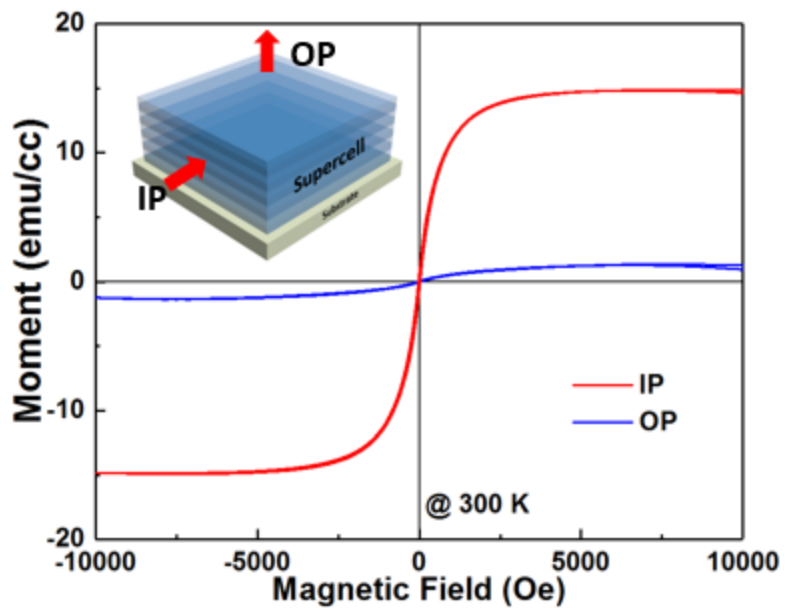


Fig. S4. Room temperature magnetic hysteresis loops with magnetic field applied in ip-plane and out-of-plane directions of BMOO film. The inset shows the corresponding magnetic field direction.

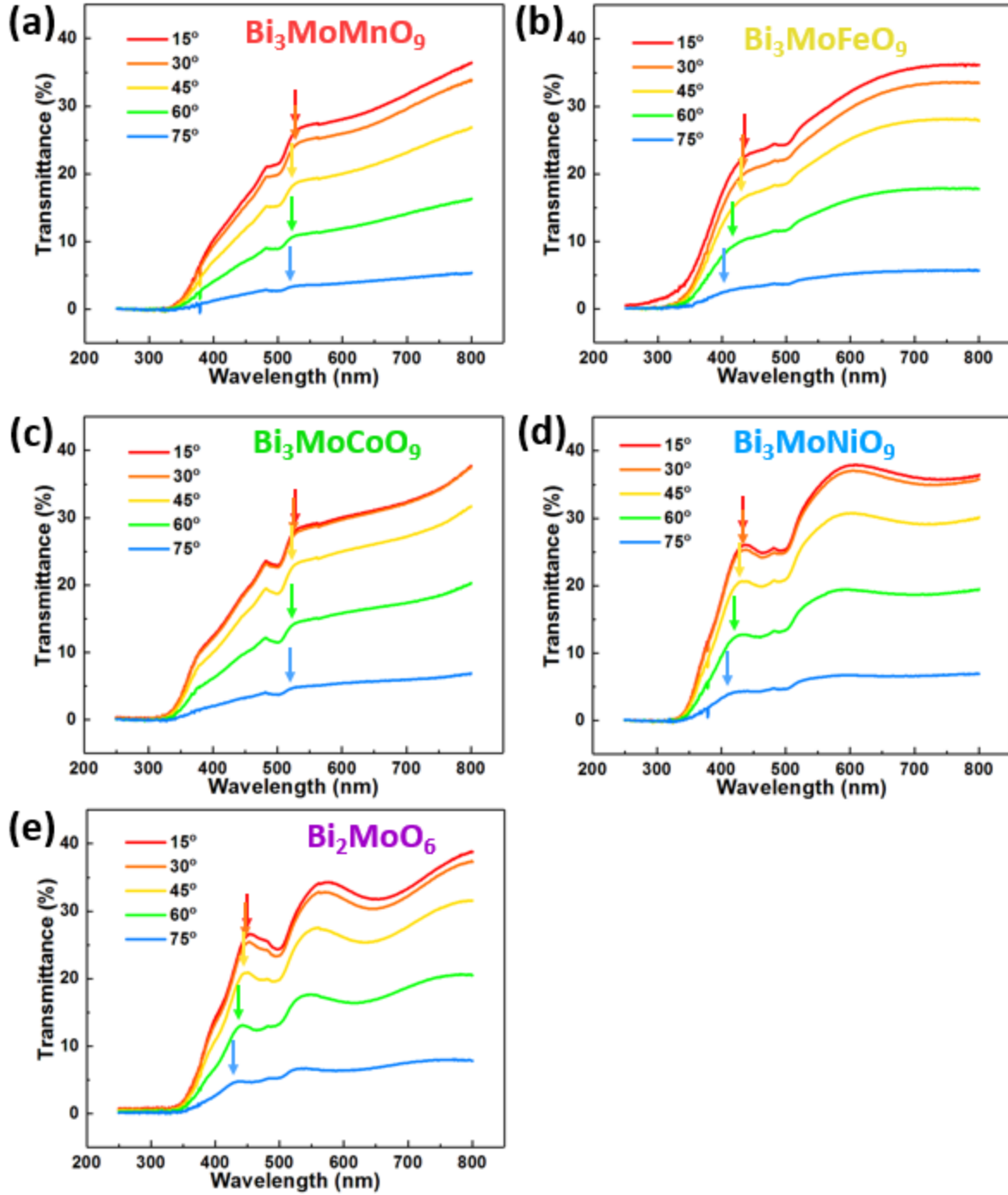


Fig. S5. (a-d) Angular dependence of the transmittance spectra of the BMoM_TO films with different elements (Mn, Fe, Co and Ni, respectively). (e) Angular dependence of the transmittance spectra of the BMoO film.