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Supplementary Information

Polarization screening-induced epitaxial growth and interfacial magnetism of $BiFeO_3/PbTiO_3$ heterostructures

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Content：

Fig. S6 SEM image, XRD pattern, field dependence of magnetization and magnetization as a function of temperature for BFO crystals synthesized without PTO nameplates

Fig. S7 Magnetization as a function of temperature for BFO/PTO heterostructures with different BFO film thicknesses under the magnetic field of 500 Oe and 1 T

Supplementary Figures

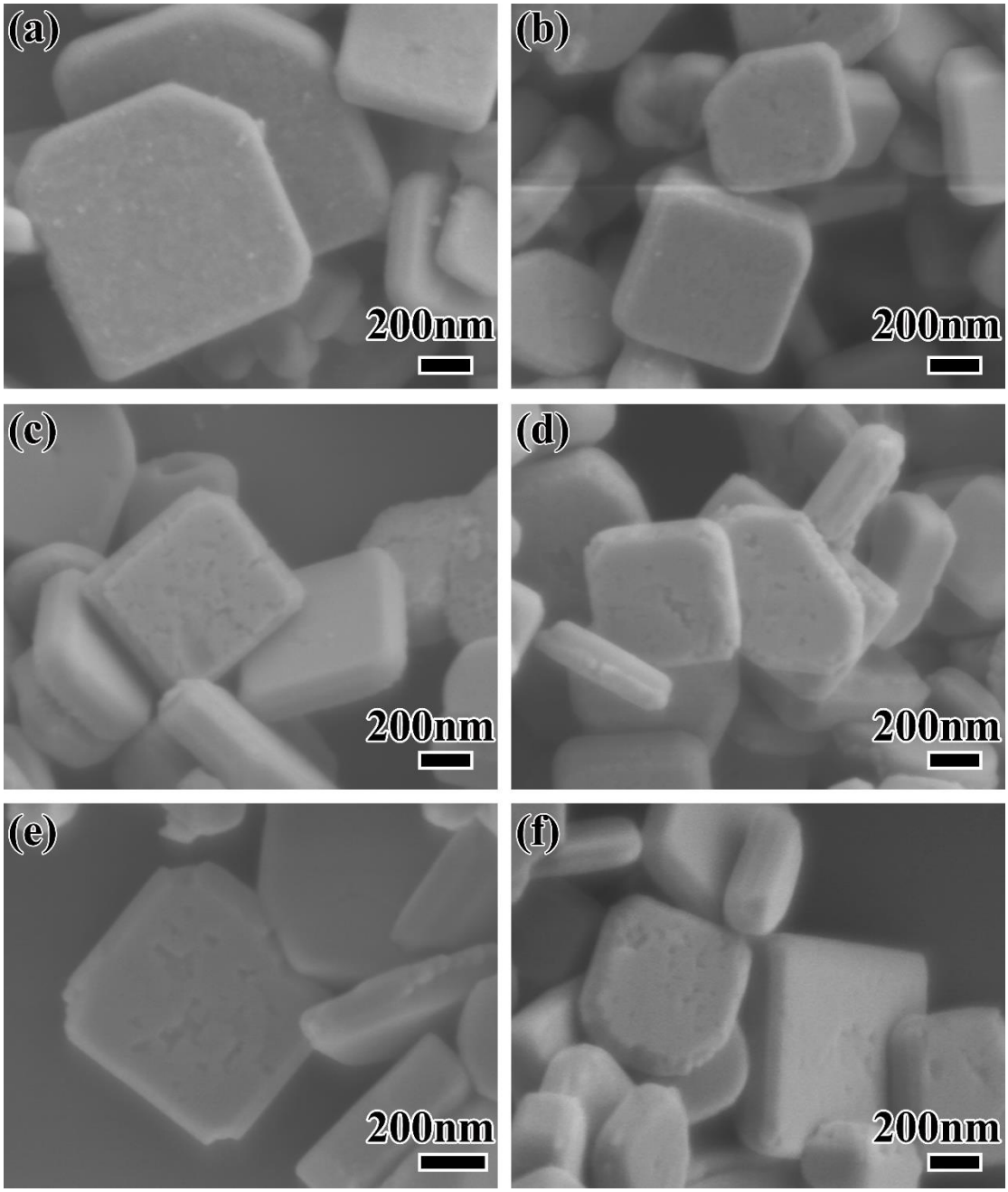

Fig. S1 SEM images of BFO/PTO heterostructures synthesized at 200 ^{o}C for different intervals of (a) 3 min, (b) 5 min, (c) 10 min, (d) 30 min, (e) 60 min and (f) 240 min.

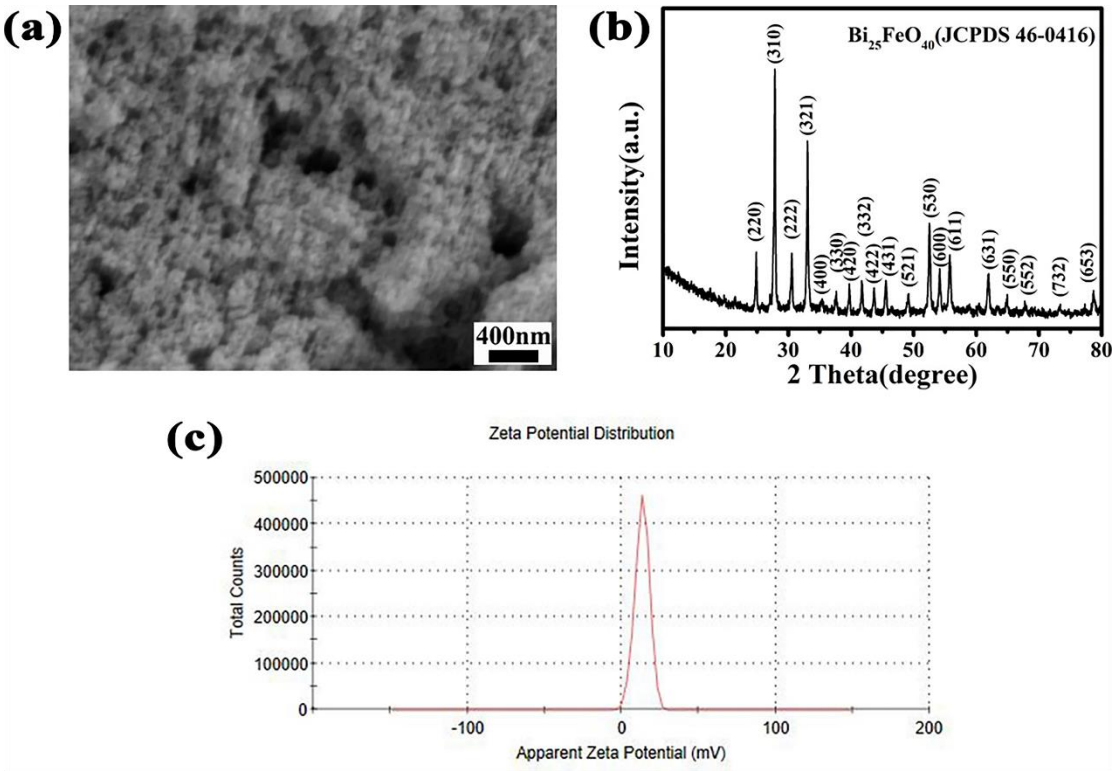

Fig. S2 (a) SEM image, (b) XRD pattern and (c) Zeta potential of $Bi_{25}FeO_{40}$ crystals synthesized by the hydrothermal method for 30 min without PTO nanoplates.

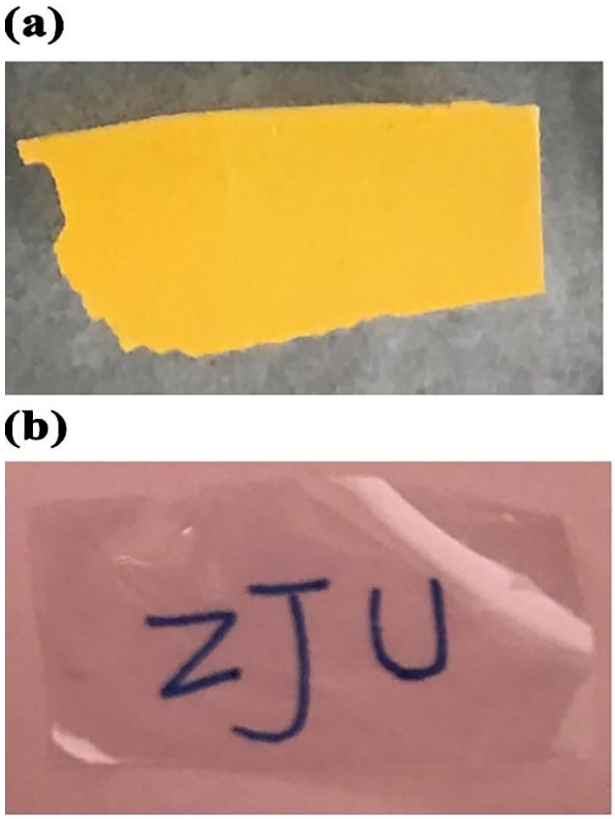

Fig. S3 (a) BFO/PTO heterostructure powders embedded in a freestanding PMMA film and (b) pure PMMA film.

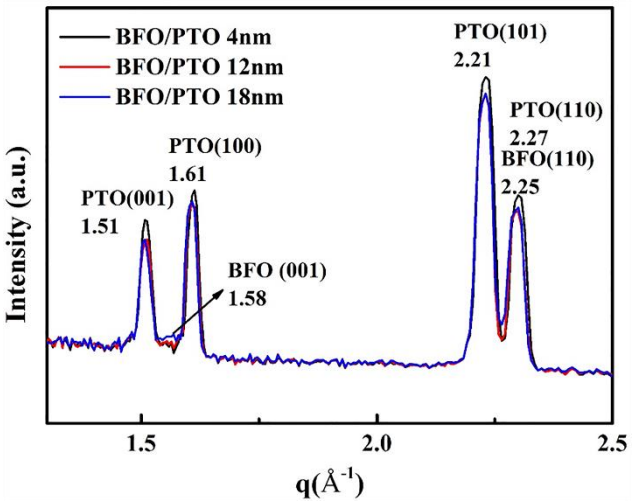

Fig. S4 GIWAXS patterns of BFO/PTO heterostructures with different BFO film thicknesses.

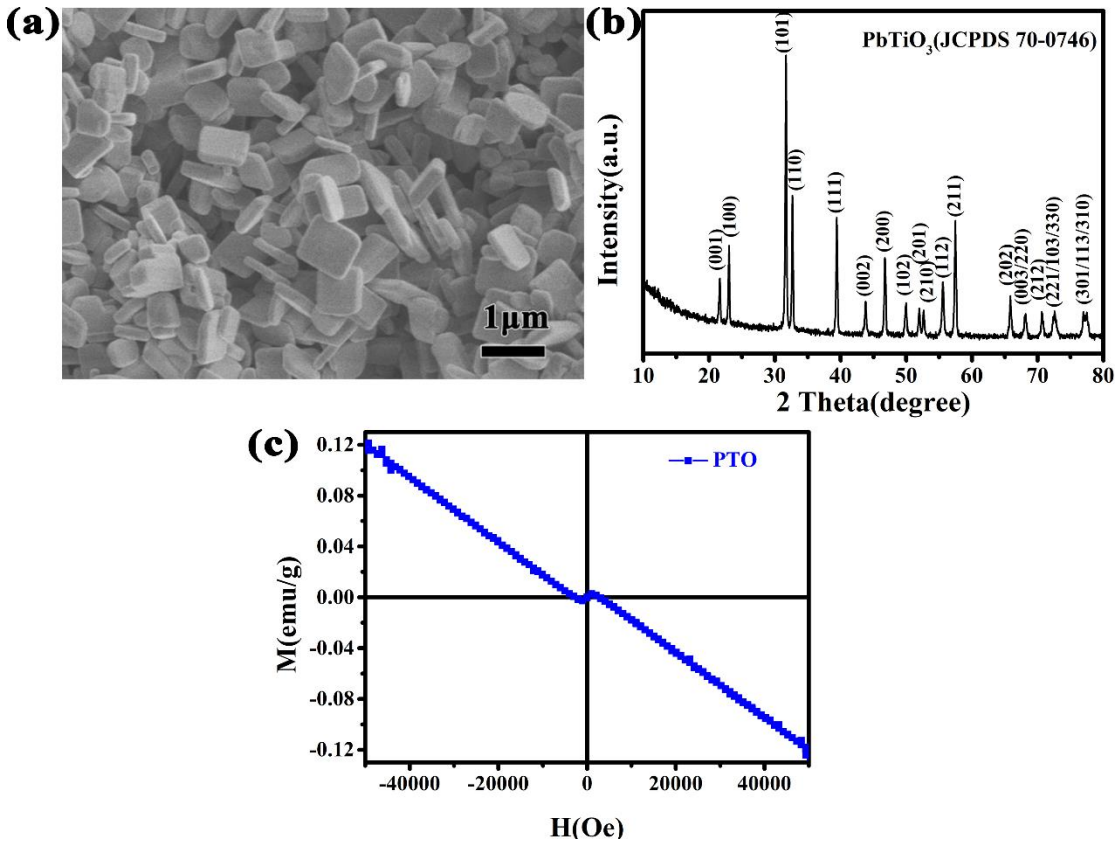

Fig. S5 (a) SEM image, (b) XRD pattern and (c) field dependence of magnetization for pure PTO nanoplates.

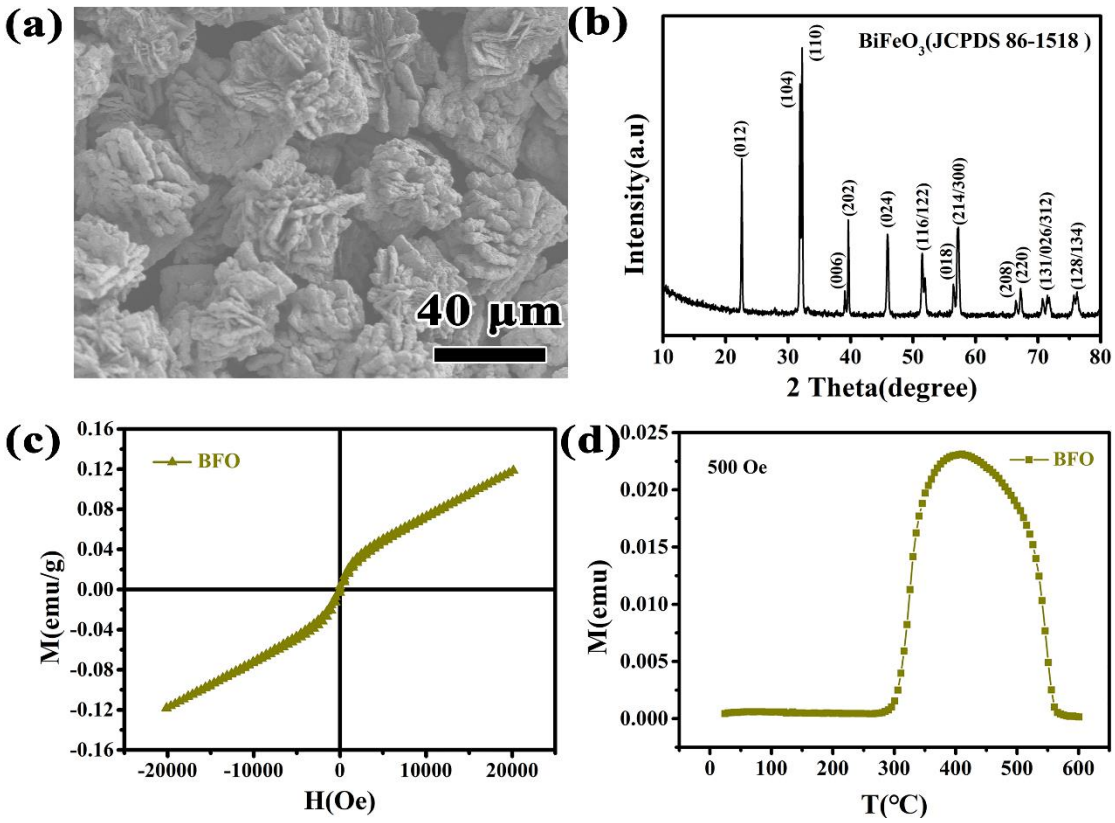

Fig. S6 (a) SEM image, (b) XRD pattern, (c) Field dependence of magnetization and (d) magnetization as a function of temperature for BFO crystals synthesized without PTO nameplates.

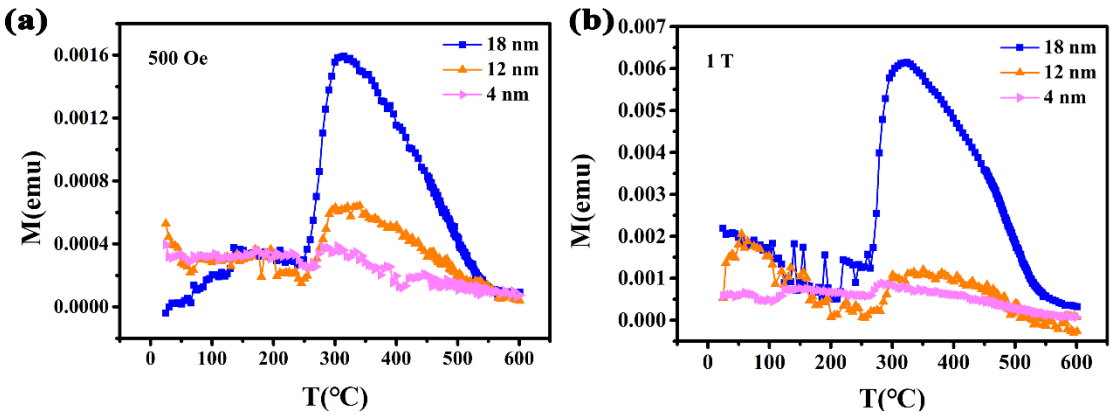

Fig. S7 Magnetization as a function of temperature for BFO/PTO heterostructures with different BFO film thicknesses under the magnetic field of (a) 500 Oe and (b) 1 T. It is worth noting that BFO/PTO samples still have significant antiferromagnetic characteristic peaks, indicating that the samples have an antiferromagnetic to paramagnetic phase transition.