Supplementary Materials

Entropy engineering in ferroelectric/dielectric superlattices for ultrahigh-efficiency superparaelectrics energy storage capacitors

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Supplementary Tables

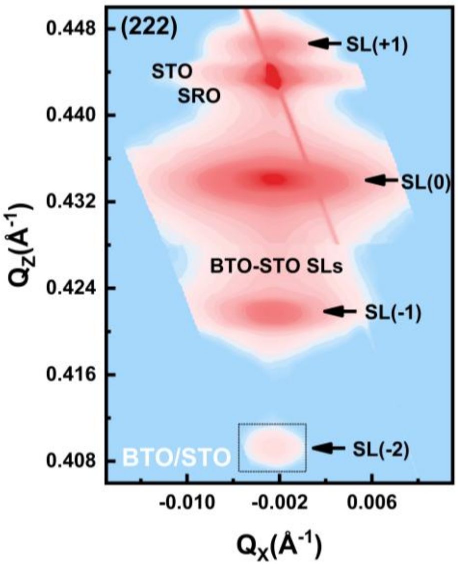
Supplementary Table 1. Growth Parameters of the Film Capacitor

Film	Temperature (°C)	Energy (mJ)	Oxygen pressure (mTorr)	Frequency (Hz)
CFO	600	330	50	10
SRO	690	370	80	10
BTO, BTO/STO and BTO/STO-BFO	690	350	5	10

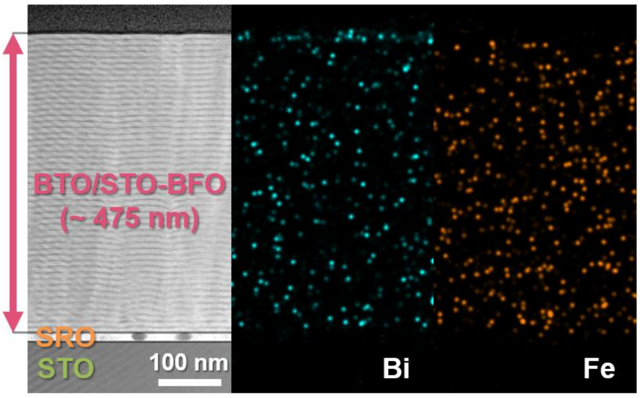
Supplementary Table 2. Structural Design of the Film Capacitor

Structural	Total excitation number	Cycle period	Excitation number per cycle		
			BTO	STO	BFO
BTO	15000	50	300	-	-
BTO/STO	15000	50	240	60	-
BTO/STO-BFO	15000	50	240	40	20

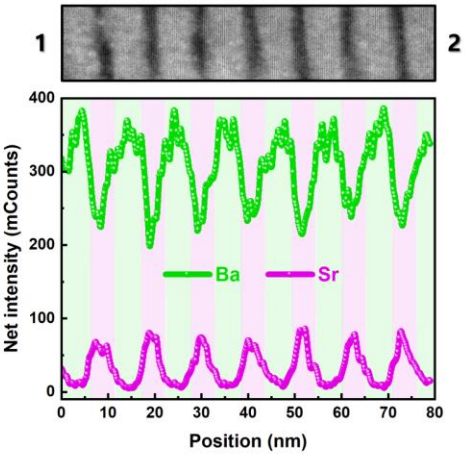
Supplementary Figures



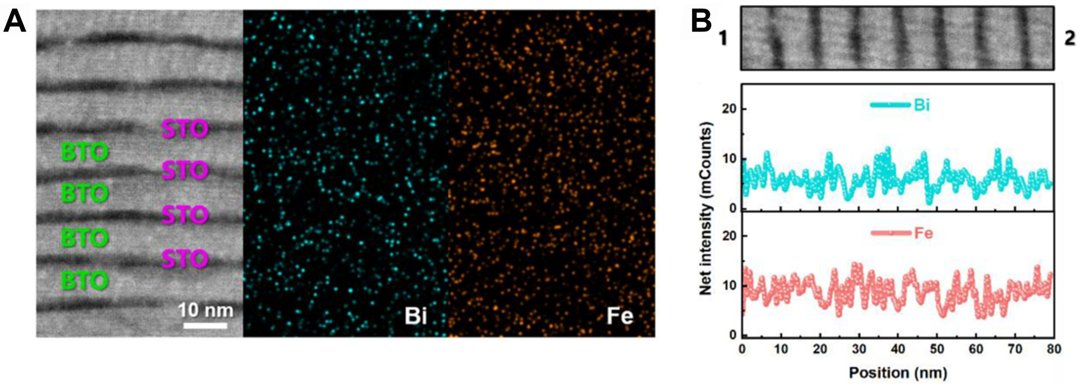
Supplementary Figure 1. The RSM of BTO/STO SLs films around the (222) reflections.



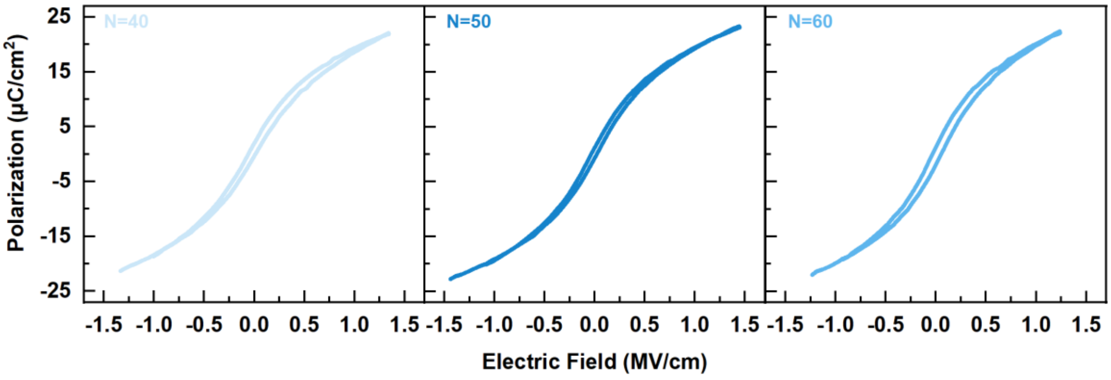
Supplementary Figure 2. The STEM image and EDS mapping of the BTO/STO-BFO SPE film with Bi and Fe elements.



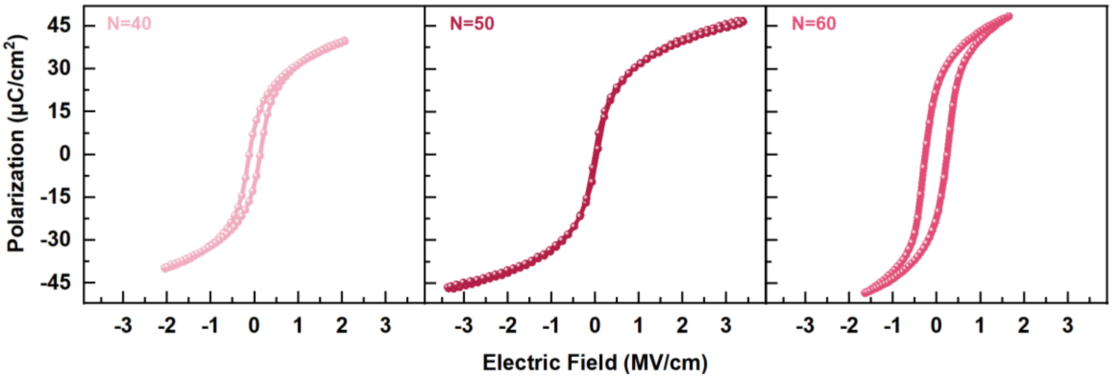
Supplementary Figure 3. The net internsity of BTO/STO SLs film in EDS mapping with Ba and Sr elements.



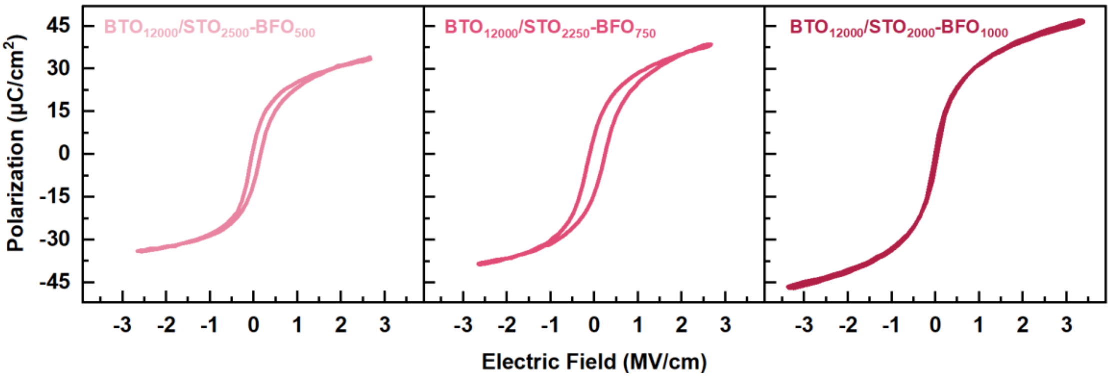
Supplementary Figure 4. (A) The STEM image, EDS mapping and (B) net internsity of the BTO/STO SLs layer with Bi and Fe elements.



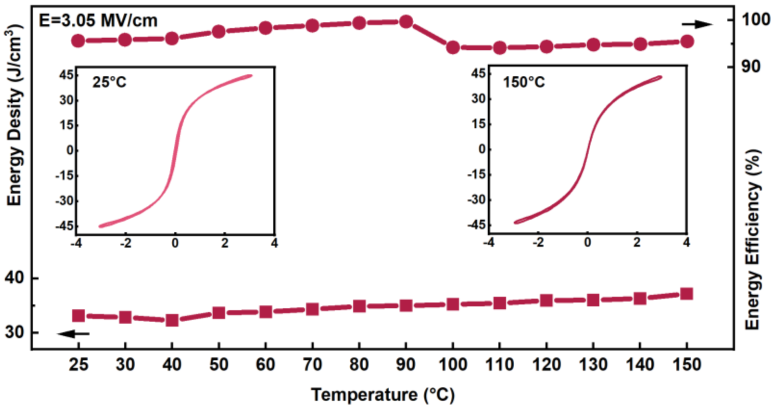
Supplementary Figure 5. The P-E loops of BTO/STO film under different cycle number (N).



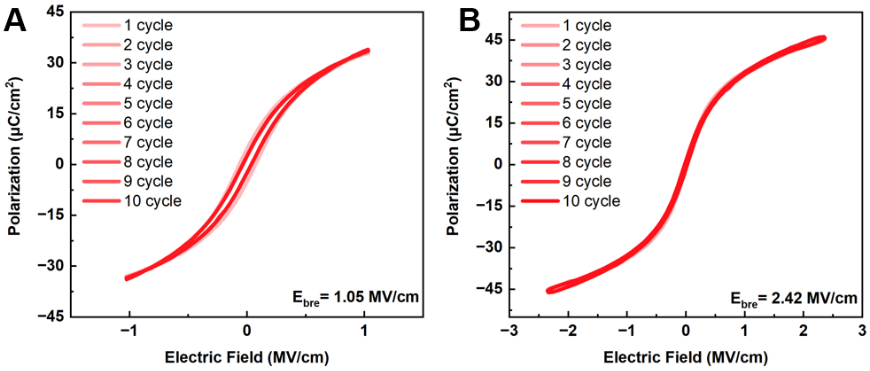
Supplementary Figure 6. The P-E loops of BTO/STO-BFO film under different cycle number.



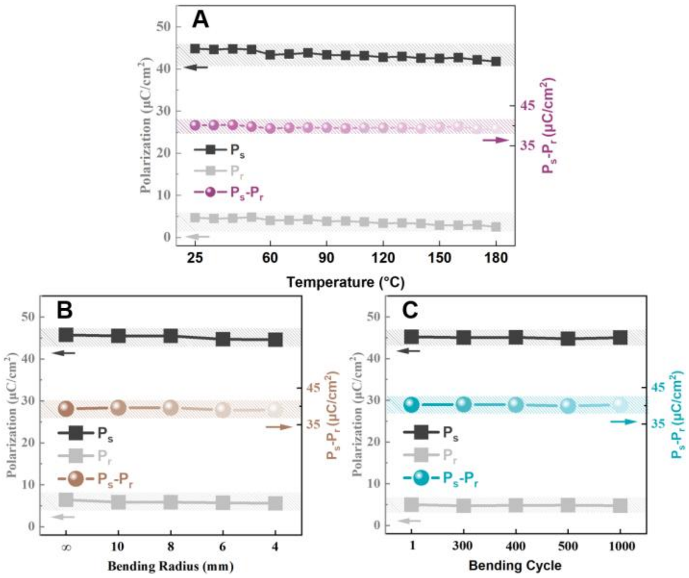
Supplementary Figure 7. The P-E loops of BTO/STO-BFO film under different pulses per cycle.



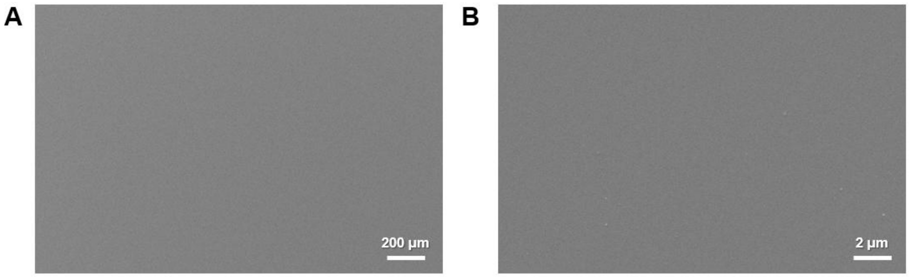
Supplementary Figure 8. The P-E loops and energy storage performance of BTO/STO-BFO SPE film on (111)-STO substrate under different temperature.



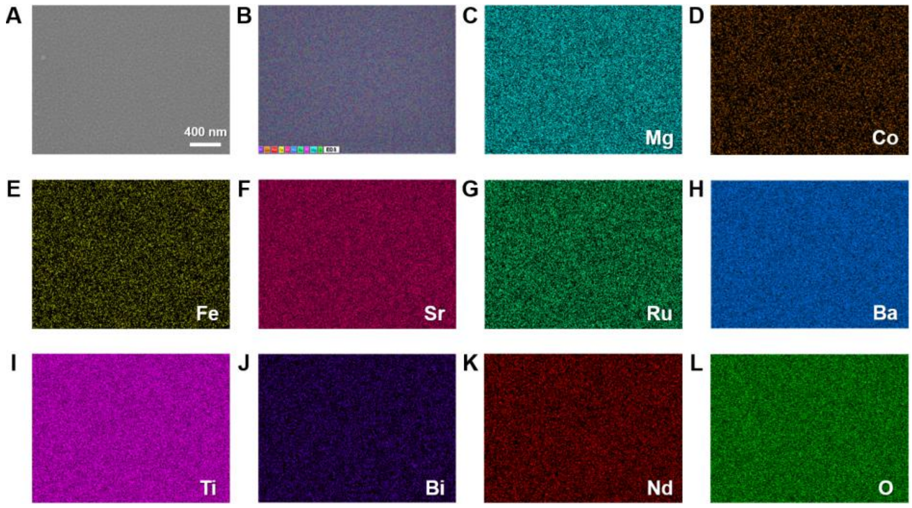
Supplementary Figure 9. (A, B) The P-E loops of flexible BTO/STO-BFO SPE film under multiple cycles at (A) 1.05 MV/cm and (B) 2.42 MV/cm.



Supplementary Figure 10. The P_s, P_r and P_s- P_r of flexible BTO/STO-BFO SPE film under different temperature (A), bending radii (B) and bending cycle (C).



Supplementary Figure 11. The SEM image of flexible BTO/STO-BFO SPE film after 1 × 10^3 bending cycle at a scale of (A) 200 µm and (B) 2 µm.



Supplementary Figure 12. The SEM image and EDS of flexible BTO/STO-BFO SPE film after 1 × 10^3 bending cycle at at a scale of 400 nm.