

## Supplemental Material

### Figure Captions

FIG. 1S Measurement schematics of the strip Indium top electrodes for the four-wire method.

FIG. 2S Cross-section SEM images of the thickness of YMO layer under pad 2 (left) and pad 3 (right) in Figure 1 (a) and (b), respectively.

FIG. 3S The I-V curves measured at two conditions. Red line is at low temperature (77 K), low compliance current (1 mA). Black line is at room temperature (300 K), high compliance current (10 mA).

FIG. 4S Cross sections in height and phase image of the YMO film. Three same positions in two images were represented by the red, green and blue horizontal line, respectively.

FIG. 5S The PUND results of the YMO/NSTO device indicating the relationship of  $P_{\max}$ ,  $P_r$  with the voltage.

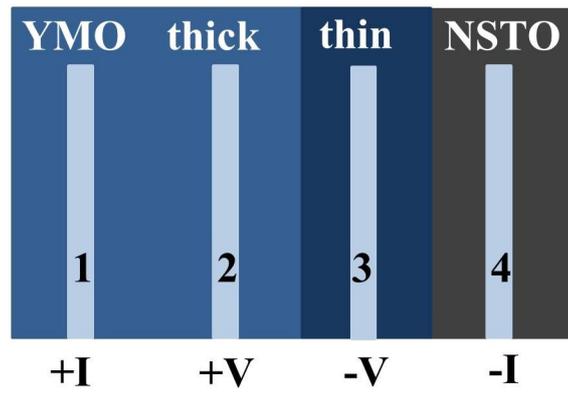


Figure S1

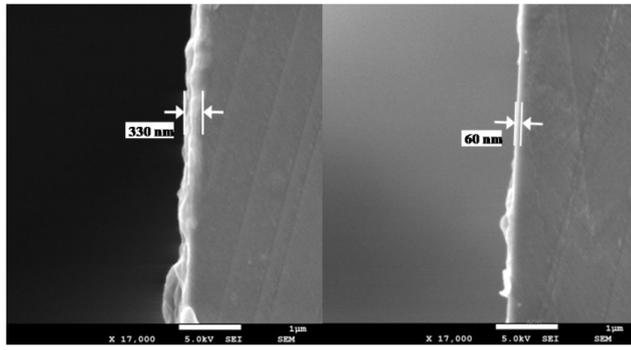


Figure 2S

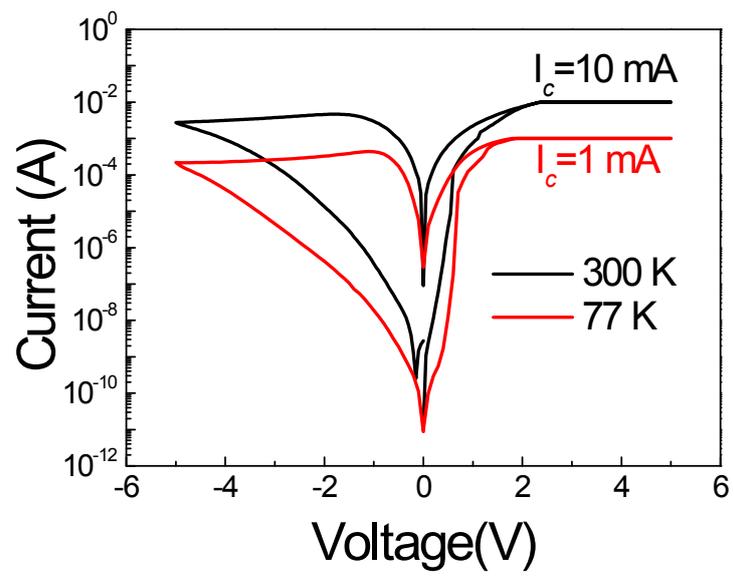


Figure 3S

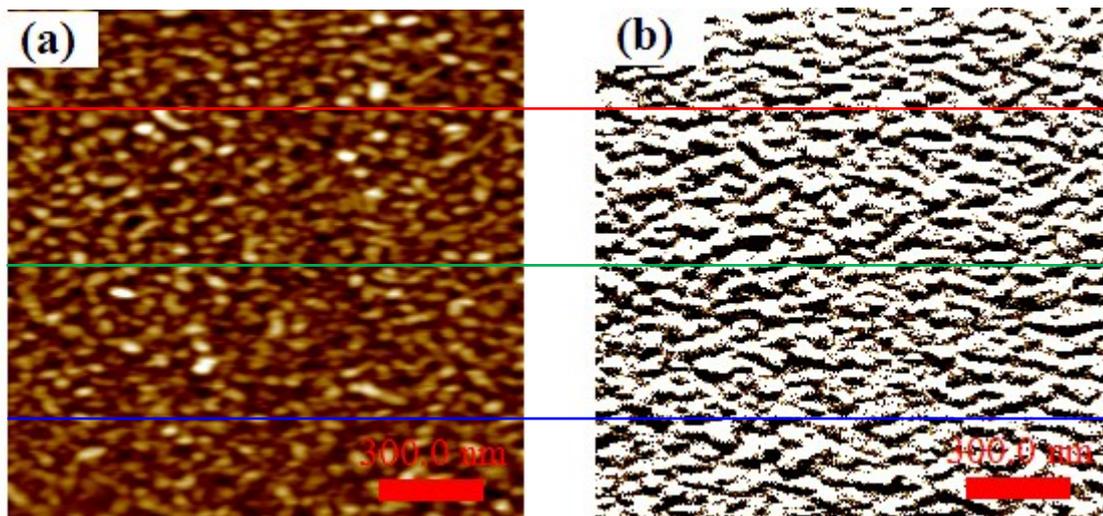


Fig. 3(a) and (b)

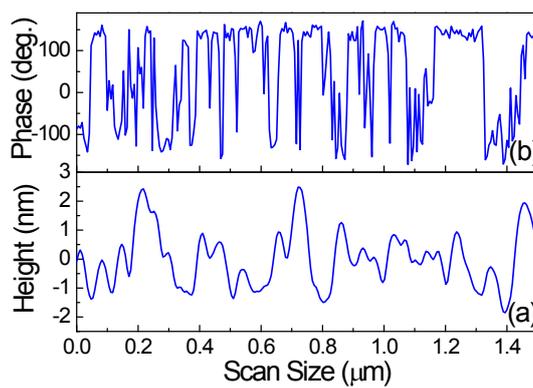
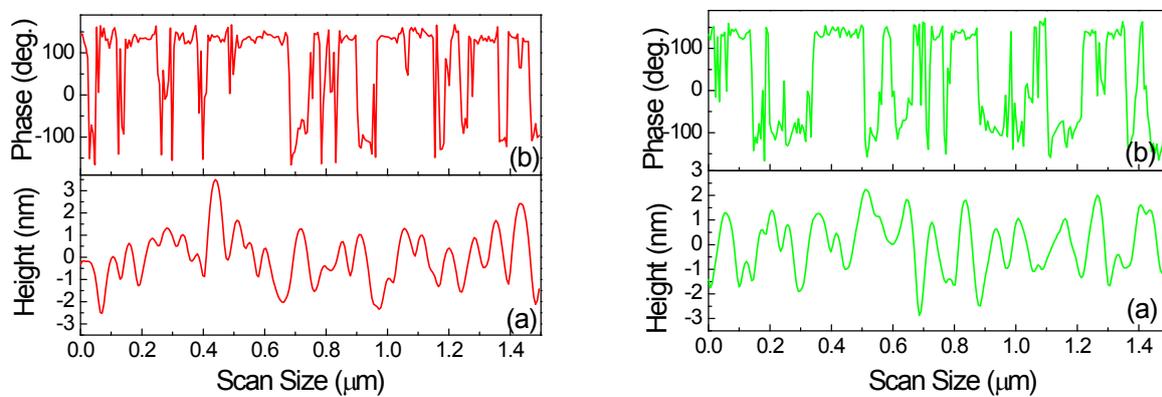


Fig. 4S

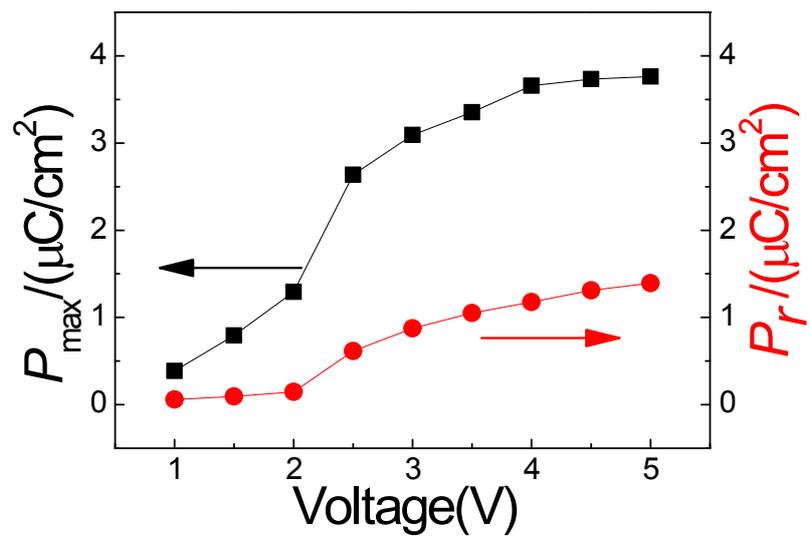


Figure 5S