

Electronic Supplementary Information (ESI)

Functional spinel oxide heterostructures on silicon

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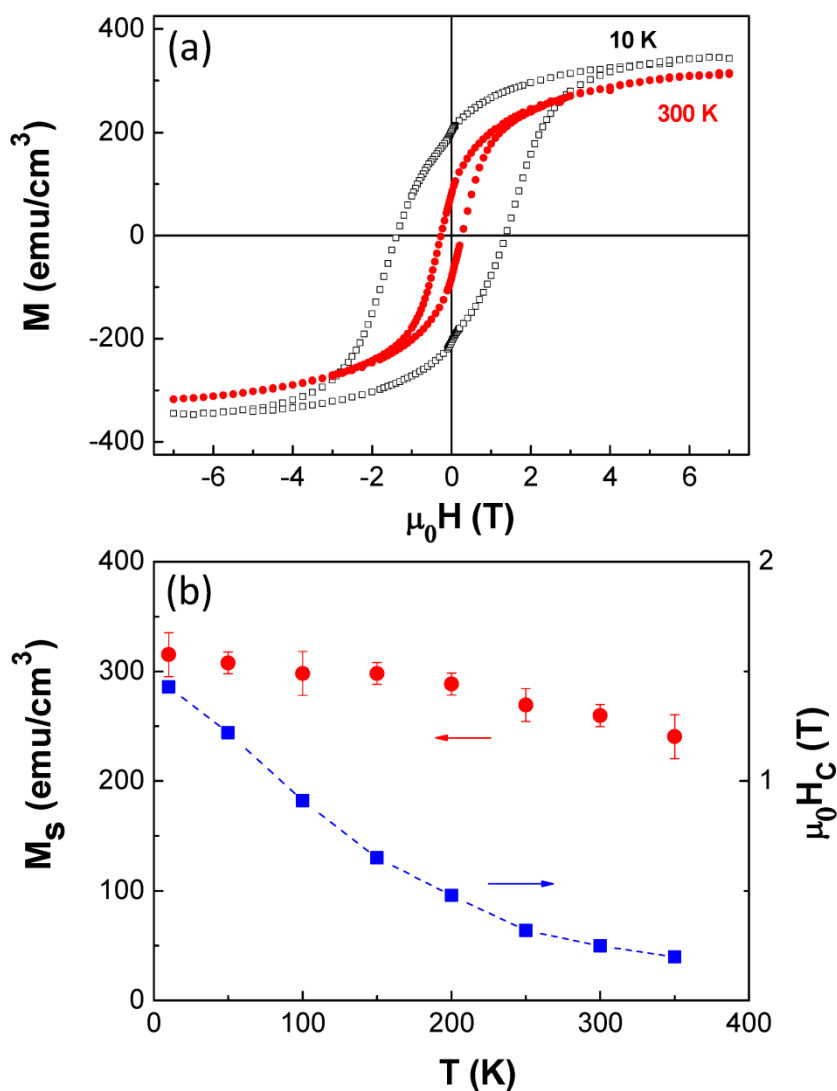


Fig. ESI 1: (a) Magnetization hysteresis loops of the $t = 47$ nm thick CFO film measured at 10 K (open squares) and 300 K (solid circles) with the field applied in-plane along the Si[11-2] direction. (b) Saturation magnetization (left axis) and coercivity field (right axis) plotted against the temperature.

Selected magnetization hysteresis loops, measured at 10 and 300 K, are plotted in Fig. ESI 1a. The epitaxial CFO(111) films on nanometric $\gamma\text{-Al}_2\text{O}_3/\text{Si}(111)$ presents a M_S close to bulk value, which decreases only slightly with temperature (Fig. ESI 1b) and remains above 240 emu/cm^3 up to 350 K (the highest temperature in our experiment), suggesting that the Curie temperature is well above room temperature as observed in other studies and in the bulk

material.^{1,2} The remnant magnetization to the saturation magnetization ratio at room temperature is about 0.5.

References

1. Y. Suzuki, G. Hu, R. B. van Dover and R. J. Cava, *J. Magn. Magn. Mat.*, 1999, **191**, 1.
2. V. A. M. Brabers, *Progress in Spinel Ferrite Research*, in *Handbook of Magnetic Materials*, Vol 8, ed. by K. H. J. Buschow (Elsevier, Amsterdam, 1995).