

Supplemental Figure 1. Thickness dependence of the dielectric properties of strained SrTiO₃ films. **a**, The thickness dependence of the measured capacitance is shown for SrTiO₃/(110) DyScO₃ films of thickness 100 Å, 200 Å, 500 Å, and 1000 Å. These films, except the one marked “as-grown,” have been annealed at 700 °C for 1 h in 1 atm of air after growth. The drop in measured capacitance with SrTiO₃ film thickness is consistent with the ferroelectricity being in the SrTiO₃ film and not associated with the DyScO₃ substrate itself or a ferroelectric interfacial layer. The decrease in C_{max} (the height of the maximum of the capacitance as a function of temperature from the background capacitance value) with decreasing film thickness is a result of non-ferroelectric (parasitic) contributions to the capacitance. Such behaviour as a function of thickness is commonly seen in (Ba,Sr)TiO₃ films and is expected. From the partial capacitance approach²⁵, the thickness dependence of the total measured capacitance of the interdigitated capacitor is $C_{measured} \approx C_0 + \frac{1}{\epsilon_0} (\epsilon_{film} - \epsilon_{sub}) L h / s$, where ϵ_0 is the permittivity of free space; ϵ_{film} and ϵ_{sub} are the dielectric constants of the ferroelectric film and substrate, respectively; h is the thickness of the ferroelectric film; s and L are the width and total length of the slot between the electrodes, respectively; and C_0 is the contribution of the air and substrate to the total capacitance of the interdigitated capacitor, which is independent of h . This approximation is valid for $L \gg s \gg h$, which is the case for our interdigitated capacitors. **b**, The thickness dependence of the dielectric tunability is shown for the same SrTiO₃/(110) DyScO₃ films shown in **a**. **c**, The thickness dependence of the dielectric tunability of SrTiO₃/(100) LSAT films with corresponding thicknesses and growth conditions to the SrTiO₃/DyScO₃ films is shown in **a** and **b**. No tunability is seen in SrTiO₃/LSAT at room temperature, regardless of film thickness.

