Supporting Information

Epitaxial growth and nanoscale electrical properties of Ce$_2$Ti$_2$O$_7$ thin films

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To highlight local ferroelectricity in the films, poling experiments were performed. Commonly, rectangular-shaped domains (~ 12 µm x 10 µm) were polarized by applying a negative bias voltage ($V_{dc} = -12$ V) on the CeTO film. Next, second rectangle (~ 9 µm x 7 µm) were reverse polarized inside the previous polarized areas by applying a positive bias voltage ($V_{dc} = +12$ V). Then, third rectangle (~ 5 µm x 4 µm) were polarized by applying a negative bias voltage ($V_{dc} = -12$ V). Finally, PFM images were recorded over large regions (~ 15 µm x 15 µm) including the three polarized areas (Figure S1). Ferroelectric properties are present regardless of the synthetic route used.

Figure S1. Out-of-plane piezoresponse image after poling and reverse poling experiments recorded on a Ce$_2$Ti$_2$O$_7$ thin film grown on (110)-oriented SrTiO$_3$ substrate by PLD. The scan area is 15 µm x 15 µm.
Figure S2. Projection of in-plane piezoelectric domains on the 3D topography of the CeTO thin film grown by PLD.