

Fig. S1 ϕ -scans collected for a La_{0.25}Ce_{0.75}O_{δ} and La_{0.50}Ce_{0.50}O_{δ} layer (d = 70-90 nm) on top of double LZO buffered Ni-5%W tape supplied by Zenergy Power GmbH.

Figure S1 shows the φ -scans of LCO layers and double LZO layers (supplied by Zenergy Power GmbH) coated on Ni-5%W substrate. This tape was first measured for the in-plane misalignment of the (111) plane of the double LZO and that of the underlying Ni-5%W substrate. This was followed by the in-plane misalignment measurement of the (111) plane of the LCO and the underlying double LZO layer. The figure shows that, the double LZO layers have grown with a 45° rotation on a Ni-5%W substrate to minimize the lattice mismatch effect of $\ge 8\%$. However, LCO layers have $\le 1\%$ lattice mismatch with LZO layers and have grown along the direction of LZO growth with a high crystallinity and a FWHM of 6°.



Fig. S2 RHEED patterns collected along the <001> direction for (a) a La $_{0.25}$ Ce $_{0.75}O_{\delta}$ and (b) a La $_{0.50}$ Ce $_{0.50}O_{\delta}$ thin film deposited on a double LZO buffer layer on Ni-5%W tape.

Figure S2 shows the RHEED patterns obtained for both layers. As expected for LCO layers that exhibit a biaxially textured surface, the RHEED reflections show discrete reflection spots along the <100> and <110> viewing direction.