Abstract Submitted
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Nanometer-scale striped surface terminations on fractured $SrTiO_3$ surfaces[1] JEFFREY GUEST, NATHAN GUISINGER, TIFFANY SANTOS, TE-YU CHIEN, ANAND BHATTACHARYA, JOHN FREELAND, MATTHIAS BODE, Argonne National Laboratory — Using cross-sectional scanning tunneling microscopy on in situ fractured $SrTiO_3$, one of the most commonly used substrates for the growth of complex oxide thin films and superlattices, atomically smooth terraces have been observed on (001) surfaces. Furthermore, it was discovered that fracturing this material at room temperature results in the formation of stripe patterned domains having characteristic widths (10 to 20 nm) of alternating surface terminations that extend over a long-range. Spatial characterization utilizing spectroscopy techniques revealed a strong contrast in the electronic structure of the two domains. Combining these results with topographic data, we are able to assign both TiO_2 and SrO terminations to their respective domains. The results of this experiment reveal that fracturing this material leads to reproducibly flat surfaces that can be characterized at the atomic-scale and suggests that this technique can be utilized for the study of technologically relevant complex oxide interfaces.

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