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Structural and electronic response via oxygen vacancy control in SrFeO3 heterostructures ALEX KRICK, EUN JU MOON, AMANDA HUON, STEVEN MAY, Drexel University — The electronic and structural properties of complex perovskite oxide thin films are often directly influenced by their oxygen vacancy concentration. Here, we investigate epitaxial films of $SrFeO_3$, which exhibits a variety of structural and electronic phases as a function of oxygen content. The ability to control these functional properties via temperature or external fields is not present in conventional semiconductors and is attractive from an application perspective. As-grown films are oxidized using a post-growth anneal in dilute ozone, yielding metallic behavior consistent with bulk $SrFeO_3$. X-ray diffraction and temperature dependent resistivity collected at different stages of oxidation and reduction reveal minute structural transformations that yield large changes in electronic behavior due to oxygen loss.

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