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Investigation of $CaMnO_3$ Epitaxial Thin Films by High Resolution X-ray Diffraction and Atomic Force Microscopy[1] GRACE YONG, RAJESWARI KOLAGANI, ZOEY WARECKI, CHRISTOPHER STUMPF, DAVID SCHAEFER, Towson University, MADHANA SUNDER, Bruker AXS Inc — $CaMnO_3$ is known for its high catalytic activity for oxidation reactions. As the surface characteristics are important in determining the catalytic properties of thin films, we are investigating the structural and morphological characteristics of epitaxial thin films grown by Pulsed Laser Deposition. Film structure and morphology are sensitive to variations in the deposition conditions such as the deposition oxygen pressure. In $CaMnO_{3-\delta}$, oxygen vacancies are found to be ordered in such a manner as to preserve most of the structural features of the parent stoichiometric perovskite. We are characterizing the films using high resolution x-ray diffraction in the reflectivity mode (low angle measurements) and using Atomic Force Microscopy. We will study Kiessig fringes as a function of film growth conditions. The film thickness can be determined from the period of the fringes and roughness can be characterized by the angular range of the fringes. We will compare the surface roughness obtained by x-ray reflectivity with those obtained using AFM (atomic force microscopy).

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