In-situ studies of $La_{(1-x)}Sr_xMnO_3$ films grown by PLD

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Sr-doped lanthanum manganite ($La_{0.8}Sr_{0.2}MnO_3$, or LSM) is a widely used material as a cathode in solid oxide fuel cells, and atomic-scale understanding of the reactions occurring at its surface is interesting from both fundamental and application-driven points of view. Atomic-scale investigations require a well-defined and well-ordered system, but LSM single-crystals are not available commercially. In the present contribution, I will show our efforts towards the establishment of a model system for LSM, in the form of a thin, pulsed-laser-deposited film onto $SrTiO_3$(110) substrates.

Combination of pulsed laser deposition with *in-situ* surface sensitive techniques (STM, LEED, XPS, LEIS) allows to controllably tune the surface composition, and establish a relation with its structure. Different surface stoichiometries result in different (but related) surface structures: It appears that LSM(110) displays a rich phase diagram, like other perovskite oxides [1, 2]. Deposition of controlled amounts of MnO, La_2O_3, and SrO allows to move between the different structures in a continuous and reversible way.

References:
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[2] D. Kienzle, *et al*, Surf. Sci. **633**, 60 (2015).