

Abstract Submitted
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The stoichiometry and Surface termination of La_{2/3}Sr_{1/3}MnO₃ film on SrTiO₃ (001) substrate * LINA CHEN, ZHEN WANG, GAOMIN WANG, HANGWEN GUO, MOHAMMAD SAGHAYEZHIAN, E.W. PLUMMER, JIANDI ZHANG, Louisiana State Univ - Baton Rouge, JING TAO, LIJUN WU, YIMEI ZHU, Brookhaven National Laboratory — It has been observed that films of La_{2/3}Sr_{1/3}MnO₃ (LSMO) are insulating when the films are below a certain critical thickness. The nature of such thickness-driven metal-to-insulator transition is still under debate: is this an intrinsic (dimensional confinement) or an extrinsic (oxygen vacancies or change of stoichiometry) effect. We have investigated the thickness-dependent composition variation in the LSMO films on SrTiO₃ (001) by Low Energy Electron Diffraction (LEED), Angle-resolved XPS (ARXPS), and scanning transmission electron microscopy (STEM). Both ARXPS and STEM results show that the LSMO films prefer to be terminated with (La/Sr)-O layer and exists a thickness-dependence of Sr vs La concentration ratio in the film as well as the Sr surface segregation, incorporated with the thickness-dependence of the out-of-plane buckling in the MnO₂ basal plane. These changes should have profound effect on the electronic and magnetic property, including the emergent insulating behavior in ultrathin films. * Supported by U.S. DOE under Grant No. DOE DE-SC0002136

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