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Charge Transfer and Lattice Distortion in strained La0.7Ca0.3MnO3 and La0.8Ba0.2MnO3 Films on SrTiO3 Substrate CHUN-BIN WU, F.P. YUAN, X.G. XU, HSIUNG CHOU[1], Department of Physics, National Sun Yat-Sen University — Lattice mismatches between $La_{0.67}Ca_{0.33}MnO_3$ (LCMOa = 3.86) and $La_{0.8}Ba_{0.2}MnO_3$ (LBMOa = 3.89) CMR thin films and the substrate $SrTiO_3$ (00la= 3.905) induce a strong tensile strain that expands the in-plane lattice and shortens the out-of-plane lattice of films. The magnetic transition temperature (T_c) and the metal-insulator transition temperature (T_{MI}) are then suppressed dramatically in LCMO films and are raised in LBMO films. The possible causes of the contrary phenomena are examined by X-ray diffraction and HRXRD which indicate that the change of T_c or T_{MI} is highly possible due to the distortion in Mn-O-Mn chains, such as the bond length and angle, that induced the variation of orbital stability and the charge transfer in itinerant e_g band.

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