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Phase separation in (001) and (110) $La_{2/3}Ca_{1/3}MnO_3$ epitaxial films J. FONTCUBERTA, I.C. INFANTE, F. SÁNCHEZ, Institut de Ciència de Materials de Barcelona-CSIC, Campus UAB, 08193 Bellaterra, Spain, M. WOJCIK, E. JEDRYKA, Institute of Physics, Polish Acad. of Sci., Al. Lotnikow 32/46, 02668 Warszawa, Poland, S. ESTRADÉ, J. ARBIOL, F. PEIRÓ, EME/CeRMAE/IN2UB, Universitat de Barcelona, 08028 Barcelona, Spain — Recent reports on the formation of a highly conducting layer at the interface between two insulators have driven a strong interest to interface physics. To explore strain and polarity effects on electronic phase separation (PS), we have grown epitaxial films of $La_{2/3}Ca_{1/3}MnO_3$ (LCMO) on (001) and (110) $SrTiO_3$ (STO) substrates. (001) LCMO/STO and (110) LCMO/STO interfaces differ on the polarity sequence. Measurements of the LCMO layers show that the (110) LCMO films display always "better" magnetic properties that their (001) LCMO counter-partners and do not show any traces of PS. Moreover, we have analyzed the properties of (001) and (110) thin LCMO films capped with a thin STO barrier and compared with those of bare LCMO films. It turns out that STO capping induces PS in (001)LCMO films but not in (110) films. Reasons for this asymmetric behaviour will be discussed.

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