Suppression of interface induced electronic phase separation in $La_{2/3}Sr_{1/3}MnO_3/SrTiO_3(110)$: ^{55}Mn NMR study.

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Interfaces influence significantly half metallic properties of mixed valence manganite thin films. In case of double exchange mediated manganites the spin states at the interface may strongly depend on the crystallographic orientation. In this work we report ^{55}Mn NMR study of $La_{2/3}Sr_{1/3}MnO_3$ films grown on (001) and (110) $SrTiO_3$ oriented substrates, and analyse the NMR results in the context of macroscopic magnetic properties. It has been found that LSMO(110) films systematically show improved magnetic properties as compared to their (001) counterparts. In contrast to the results obtained for LSMO(001) films, the ^{55}Mn NMR spectra recorded for LSMO(110) films show only a mixed valence ($Mn^{3+/4+}$) resonance line without any contribution from localized (Mn^{4+}) charge states present in case of LSMO(001) films. These findings will be discussed in the context of a possible interface reconstruction driven by the lattice mismatch and polarity discontinuity at the LSMO/STO interface.

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