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Stabilization of a ferromagnetic insulating phase with colossal magnetoresistance at the interface of manganite bilayers[1] JONATHAN LAVERDIÈRE, SERGE JANDL, PATRICK FOURNIER, Université de Sherbrooke — The charge ordered phase observed in colossal magnetoresistive manganites motivated many theoretical and experimental efforts. Charge order is an insulating electronic phase that becomes metallic in sufficiently high magnetic field. This high "melting" field hinders any applications for magnetic storage devices. Here, we present the study of the proximity effect in $Nd_{0.67}Sr_{0.33}MnO_3$ (NSMO) / $Nd_{0.5}Ca_{0.5}MnO_3$ (NCMO) bilayers. NSMO is dominated by ferromagnetic double exchange, producing a ferromagnetic metallic phase, while NCMO is strongly influenced by the Jahn-Teller lattice distortion, localizing charges on the Mn^{3+} sites. Our study addresses the following question: Which one will dominate at the NSMO/NCMO interface? We will present Raman scattering and magnetotransport measurements on NCMO/NSMO bilayers grown on $SrTiO_3$ substrate. A ferromagnetic insulating phase has been observed for very thin NSMO films. This phase becomes metallic and gives rise to colossal magnetoresistance at a low field compared to the usual melting field.

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