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Enhanced Low Field Magnetoresistance in $La_{0.67}Ca_{0.33}MnO_3/La_{0.5}Ca_{0.5}MnO_3$ superlattices P.V. WADEKAR, Q.Y. CHEN, O. LOZANO, P.V. CHINTA, W.K. CHU, D. WIJESUNDERA, Department. of Physics & Texas Center for Superconductivity, University of Houston, Texas, 77204, USA, C.S. LIN, P.H. TSENG, Y.T. LIN, L.W. TU, C.P. LIN, H. CHOU, C.C. KUO, Deptartment of Physics & Center for Nanoscience and Nanotechnology, National Sun Yat Sen University, Kaohsiung, Taiwan, Republic of China, N.J. HO, Deptartment of Materials and Optoelectronic Sciences and Center for Nanoscience and Nanotechnology, National Sun Yat-Sen University, Kaohsiung, H.W. SEO, Department of Physics, University of Arkansas, Little Rock, AR 72204 — We have grown [1 nm/ 1nm]$_n$ superlattices of manganite (n = 20, 30,40) in which $La_{1-x}Ca_xMnO_3$(x=0.33) serves as the ferromagnetic layer while $La_{1-x}Ca_xMnO_3$(x=0.5) serves as the spacer layer on $LaAlO_3$ substrates by magnetron sputtering. The samples were characterized by XRD, Magnetotransport measurements, Rutherford backscattering spectroscopy, and atomic force microscopy. Enhanced longitudinal magnetoresistance (MR) under an applied field B, defined as MR (B) = ρ(B)/ρ(0) – 1, was as much as -49% at B=0.5 Tesla and T=90 K. The causes for this enhancement not seen at low field in other single-layered films of x=0.33 and the correlation of oxygen annealing with the MR effects for the superlattices will be discussed.

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