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Non-saturating magnetoresistance of $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ thin films in pulsed magnetic fields up to 60T.¹ WEI NIU, MING GAO, XUEFENG WANG, Nanjing University — The mixed-valence manganite $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ (LSMO) is an interesting material for spintronics due to its intrinsic magnetoresistance properties. In this work, high quality LSMO films with atomic terraces are epitaxially grown on SrTiO_3 (100) substrates by laser molecular beam epitaxy. The magnetoresistance of LSMO thin films has been measured in pulsed magnetic fields up to 60T over a wide temperature range. Unsaturated magnetoresistances and resistance relaxation of LSMO thin films have been found at different temperatures. Unlike polycrystalline manganites, a linear increase with fields of the magnetoconductance at low temperature which is attributed to the spin-dependent tunneling via grain boundaries. However, the unsaturation magnetoresistances of our LSMO thin films at different temperature show two kinds of trends: quadratic at low temperature; quasi-linear at high temperature. We attribute the unsaturation behavior to the scattering of domain walls.

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