

Investigating the magnetic order in strained thin films of $\text{Pr}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ by muon spin relaxation

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We have studied the antiferromagnetic transition temperature in a thin film (25 nm) of $\text{Pr}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ (PCMO) on SrTiO_3 (STO), which also shows charge and orbital order. The tensile strain was shown earlier to yield a considerable increase of the charge ordering temperature [1]. Here we measure the spin depolarization of low-energy muons [2], and find that the onset of magnetic order in such a strained film is at the same temperature as the antiferromagnetic ordering temperature of bulk material [3,4], from which we infer that strain has not changed the magnetic order. This is in very good agreement with published theoretical results and the general understanding of the physics of manganites at half-filling.

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