

The influence of epitaxial strain on $\text{La}_{2/3}\text{Sr}_{1/3}\text{MnO}_3$ (LSMO) thin films has been studied by magneto-optical spectroscopy. The investigated samples have been grown by pulsed laser deposition on four different substrates with varying degree of compressive and tensile strain. The spectra of the magneto-optical Kerr effect (MOKE) have been measured. Deterioration of magnetic properties with increasing epitaxial strain has been observed. The off-diagonal elements of the permittivity tensor, numerically calculated from the MOKE and spectroscopic ellipsometry measurements, confirmed two already reported electronic transitions. A third transition at around 4.3 eV has been observed on samples grown under compressive strain. The dependence of the Kerr rotation spectra on temperature has been measured for all four samples. The Curie temperatures have been estimated for all samples with the exception of LSMO grown on LaAlO_3 which undergoes a spin reorientation transition at 200 K. The low temperature measurements on the compressively strained samples showed amplification of the third transition supporting the claim of it being paramagnetic. Also observed was a change in the spectra of the Kerr rotation of the sample grown on SrTiO_3 which undergoes a structural transition at 105 K, and, therefore, changes the epitaxial strain.