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Anisotropic magnetoresistance in $\text{La}_{0.4}\text{Pr}_{0.3}\text{Ca}_{0.3}\text{MnO}_3$ thin films

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Abstract

The paper presents a study on the magnetoresistance (MR) and anisotropic magnetoresistance (AMR) properties of $\text{La}_{0.4}\text{Pr}_{0.3}\text{Ca}_{0.3}\text{MnO}_3$ (LPCMO) thin films. The thin films were grown using pulsed laser deposition method on LaAlO_3 (LAO) (111) and MgO (MGO) (100) substrates, with a thickness of approximately 90 nm as estimated by X-Ray reflectometry (XRR) method. The LPCMO sample on the LAO substrate exhibited a lower metal-insulation transition than the one on the MgO substrate due to high compressive stress. The MR was found to be 57% and 98% for LPCMO/LAO and the LPCMO/MGO films, respectively. The LPCMO/MGO sample also showed a significantly higher MR (80%) compared to LPCMO/LAO sample (32%), indicating its potential application.

Keywords: manganite, thin film, anisotropic magnetoresistance.

For full article, refer to the Persian section