

Abstract Submitted
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Optical and magneto-optical studies of ferromagnetic manganese oxides thin films¹ H.L. LIU, KENNETH Y. -J. ZHANG, K.S. LU, Department of Physics, National Taiwan Normal University, Taiwan, L. UBA, S. UBA, Institute of Experimental Physics, University of Bialystok, Poland, W. -J. CHANG, J.- Y. LIN, Institute of Physics, National Chiao Tung University, Taiwan, L.M. WANG, Department of Electrical Engineering, Da-Yeh University, Taiwan — We report on the optical and magneto-optical (MO) properties of ferromagnetic $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$, $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$, $\text{La}_{0.7}\text{Ce}_{0.3}\text{MnO}_3$, and $\text{La}_{0.7}\text{MnO}_3$ thin films epitaxially grown on SrTiO_3 substrate. The optical reflectance and transmittance of the samples were measured over a broad frequency range ($50\text{-}52000\text{ cm}^{-1}$) and at temperatures between 20 and 340 K. To extract the optical constants of the films, we analyzed all of the layers of this thin-film structure using a Drude-Lorentz model. The MO polar Kerr spectra of the samples were measured in an applied magnetic field of 1.5 Tesla between 0.74 and 5.6 eV. The off-diagonal components of the dielectric tensor were calculated by analyzing Kerr rotation, ellipticity, and the determined diagonal elements of the dielectric tensor. These data clearly show that accurate values of diagonal and off-diagonal components of the dielectric tensor are important for the spin-polarized band-structure studies in the ferromagnetic manganese oxides thin films.

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