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Exploring Temperature Dependent Magnetization of $La_{2/3}Sr_{1/3}MnO_3$ and Related Perovskite Heterostructures through Optical Probe Techniques MATTHEW SHEFFIELD, The Ohio State University, JASON HOFFMAN, Argonne National Laboratory, HANTIAN GAO, MICHAEL SWARTZ, LEONARD BRILLSON, The Ohio State University, ANAND BHATTACHARYA, Argonne National Laboratory, EZEKIEL JOHNSTON-HALPERIN, The Ohio State University — $La_{2/3}Sr_{1/3}MnO_3$ (LSMO) and related perovskite oxides lend themselves to a wide range of applications due to their varied magnetic and insulating states that rely on doping, film thickness, or strain. By carefully tuning these properties, unique magnetic and electronic states can emerge at the interface and in the bulk of the material. LSMO, in particular, has drawn attention due to its room temperature ferromagnetism and half metallicity. Here, we present work detailing the optical response of thin film LSMO grown on $SrTiO_3$ (001) (STO) substrates and related perovskite heterostructures as a function of temperature and applied magnetic field. Magneto-optical Kerr Effect (MOKE) measurements are taken at varying wavelengths in order to probe different energies of the LSMO film. By probing the LSMO films and heterostructures, we gain an insight into the magnetic nature of the material and discuss possible sources of the optical response.

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