Dielectric properties of TbMnO$_3$ and La(Sr,Ca)$_{0.3}$MnO$_3$—evidence for spectral weight changes up to 20 eV. S. MÜLLER, M. RUBHAUSEN, R. RAUER, A. RUSYDI, M. BASTJAN, G. NEUBER, S. DASTJANAFAHARANI, B. SCHULZ, S. SINGER, A. LICHTENSTEIN, Universität Hamburg, D. ARGYRIOU, Hahn-Meitner Institut, Berlin, K. DÖRR, IFW, Dresden — In order to analyze changes in the kinetic energy that occur at the transition into the magnetic state we have performed ellipsometry measurements (0.5-5.5 eV) and reflectance measurements (4 – 20 eV) covering in total a spectral range between 05 and 20 eV. First, we evaluate thermal difference reflectance spectra and find changes at the transition into the magnetic state for both undoped TbMnO$_3$ and doped La(SrCa)MnO$_3$ exceeding energies up to 20 eV. We find distinct changes at the magnetic transitions for energies around 2 eV, 4 eV, 8 eV, 12 eV, and 18 eV. We attribute the first two transitions to Mn d-d high-spin and Op-Mnd charge transfer transitions. The transition at 18 eV is most likely connected to the O2s to O2p transition, whereas the origin of the transitions at 8 and 12 eV remain to be discussed.

S. Müller
Universität Hamburg

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