

Within this thesis the optical properties of  $\text{LaMnO}_3$  are examined.  $\text{LaMnO}_3$  orders into the class of strongly correlated transition metal oxides - famous for their rich phase diagrams and not completely understood interplay of their electronical, magnetical and structural degrees of freedom.  $\text{LaMnO}_3$  is a parent compound that can by doping show effects like the colossal magnetoresistance (CMR). Understanding mechanisms in the undoped material influences the understanding of these interesting phases likewise. The importance of the electron-phonon coupling is evident for the CMR effect and also object of this work as it is in discussion as one leading mechanism via the Jahn-Teller effect that can drive the orbital ordering found in  $\text{LaMnO}_3$ . A resonance Raman scattering study at an orbitally ordered  $\text{LaMnO}_3$  single crystal has been performed with 12 excitation energies between 1.8 eV (near IR) and 5.0 eV (deep UV) at room temperature and complemented by spectroscopic ellipsometry measurements. The inelastic light scattering experiments have been operated on a novel Raman spectrometer (McPherson) equipped with a UV-sensitive charge-coupled device and with a reflecting objective in a Cassegrain design allowing to extend excitation energies and the Raman scattering range into the UV in contrast to the usually performed measurements with visible excitation energies. From the comparison of the resonance profiles we derive the most important excitonic states for the Raman process in  $\text{LaMnO}_3$ . Enhanced multiphonon scattering affirms the assignment of an orbitally ordered state mainly driven by the Jahn-Teller effect, which is complemented by theoretical calculations within the Franck-Condon mechanism by Vasili Perebeinos and Philip Allen [V. Perebeinos and P. B. Allen, Phys. Rev. B **64**, 085118 (2001)] that match remarkably well to our experimental results and lead to an orbiton energy assignment of 2 eV. In summary, we have shown the efficiency of inelastic light scattering to study the interplay between electronical and structural degrees of freedom in  $\text{LaMnO}_3$  and this way likewise to receive information about the orbital ordering.