

David Wagenknecht: Abstract of a diploma thesis Optical response of magnetic materials, 2014

Magneto-optical properties of anisotropic semiconductors are studied to describe asymmetry of $\text{Ga}_{1-x}\text{Mn}_x\text{As}$, because theoretical calculations predict extraordinary behaviour of reflectivity. Analytical formulae to describe materials with non-diagonal permittivity are derived and they are used for the numerical calculations to describe the optical response of the samples available for the measurement. The transversal Kerr effect is calculated and it exhibits asymmetry in both rotation of the plane of polarization and ellipticity of circularly polarized light due to asymmetry in reflectivity. Moreover, longitudinal and polar magnetization are studied because of the influence on the observability of the phenomena. Results are not only used to discuss conditions, which must be satisfied to prove the asymmetry, but also the actual experimental setup is designed to prepare the measurement.