

Antiferromagnets, magnetically ordered materials without macroscopic magnetization, are rather difficult to study by conventional magnetic characterization tools. This thesis was focus on optical research of antiferromagnets. We studied in detail magneto-optical effects quadratic in magnetization, magnetic linear dichroism and Voigt effect, that are present even in compensated antiferromagnets. We studied magnetic semiconductor (Ga,Mn)As where these effects are rather pronounced and by employing a 2-dimensional electromagnet, we demonstrated that these effects can be used for a determination of magnetic and magneto-optical anisotropy in investigated materials. Alternative approach was used in a thin film made from a non-collinear antiferromagnet  $\text{Mn}_3\text{NiN}$  where we studied changes of optical and magneto-optical properties. We revealed that they are strongly affected by the strain connected with the temperature-induced phase transition in the STO substrate. This demonstrates that optical spectroscopy can be used for the research of antiferromagnets quite efficiently.