

The optical response of a material is affected by many things, including magnetization. Experimentally, the magneto-optical part can be measured well, for the evaluation of experimental data it is important to be able to categorize the measured data, which we can do for some specific geometries (e.g. Faraday effect, Voigt effect). The basis of the work was the perturbation solution of the wave equation, its principle is the distribution of the permittivity of the material into a non-perturbed part and a perturbed part, the perturbed part here corresponds to the contribution to the permittivity tensor caused by magnetization. Furthermore, we were looking for how to decompose the permittivity perturbation into components that could be used to characterize the magneto-optical effect. The main result of the thesis is that, using the perturbation solution of the wave equation, we have shown that when light is incident perpendicularly on a magnetic material, with magnetization pointing in any direction, we can decompose this magnetization into a component perpendicular and parallel to the direction of light propagation.