

Title: Construction of laser scanning magneto-optical microscope

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Abstract: The main goal of this thesis was to build a scanning magneto-optical microscope in the newly established Magneto-optical laboratory at the Department of Chemical Physics and Optics and particularly to compare different techniques for detection of magneto-optical (MO) signals. During the preparation stages, we first simulated the signal detected in different optical arrangements using Jones matrix formalism. Subsequently, we verified the functionality of the constructed microscope using a ferromagnetic sample of YIG:Pr and we compared experimentally different methods of the MO signal detection. Obtained experimental results are in perfect qualitative agreement with the predictions of Jones theory.

Keywords: scanning magneto-optical microscope, Kerr effect, magnetic domains