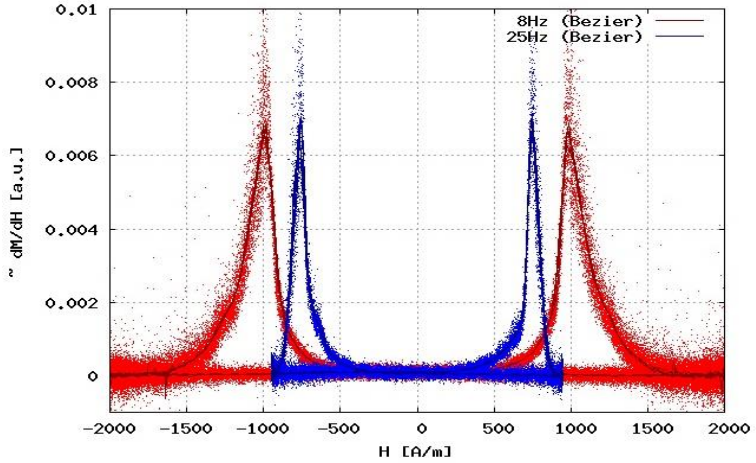
AN OPTICAL MAGNETOMETER BASED ON THE MAGNETO-OPTICAL KERR EFFECT

Senderáková D.[1], Držík M.[2], Maxová V.[1], Iliť T.[3]

[1]*FMPI at Comenius University at Bratislasva, Bratislava, Slovak Republic*
[2]*International Laser Centre, Bratislava, Slovak Republic*
[3]*FEEIT at Slovak University of Technology, Bratislava, Slovak Republic*

Contemporary, the magneto-optical Kerr effect present in the base of methods used to analyze magnetization of surfaces and thin layers, is a point of a great interest. A local application, high senzibility and fast feedback belong to its advantages. The paper shows some results obtained while verifying the functionality of a new magnetometer setup designed in ILC in Bratislava. A great numerical aperture of the objective used to direct both, the light incident and light reflected from the sample, provided a high mechanical stability of the set-up, important especially when low-intensity light recorded. Recording electronics enabled to average the measured signal and to supress the boadband noise.
A 70 nm thick layer of Co on Si substrate and also an amorphous Fe-Ni-Nb-B alloy, in AC external magnetic field and longitudinal, polar and transversal configurations were used.
The exciting AC magnetic field frequency influence on the hysteresis loops was observed. Obtained results proved the size anisotropy of the Co sample studied and showed the influence of the light polarization (TE, TM) and wavelength (405 nm, 670 nm) on the magneto-optical Kerr effect detection sensitivity, too.



Dependence of the real part of the dynamical susceptibility on the exciting magnetic field intensity at two frequencies (640 nm, TM, 8 Hz and 25 Hz, longitudinal MOKE)