

Garnets – selected problems of magnetization dynamics.

A.Maziewski

*Laboratory of Magnetism, Faculty of Physics, University of Białystok, Lipowa 41, 15-424
Białystok, Poland*

Garnets – films are very interesting systems where different effects were studied such as e.g. the propagation of nonlinear spin-waves, Bose–Einstein condensation of a magnon gas, high-temperature photomagnetism [1] and femtosecond laser pulses induced ultrafast dynamics connected with: the inverse Faraday effect [2] or light-induced changes in magnetic anisotropy [3].

This presentation will be focused on review of linearly polarized light induced magnetization dynamics in $(\text{YCa})_3(\text{FeCoGe})_5\text{O}_{12}$ epitaxial films. Polarized argon laser light pulses (milliseconds regime) driven a displacement of boundary between magnetic domain phases with different in-plane magnetization components was observed at room temperature [1]. This magnetization process is connected with light-induced uniaxial magnetic anisotropy. This photomagnetic effect was explained by light induced rearrangement of strongly anisotropic Co^{2+} ions at octahedral positions [4]. Magnetization in YIG:Co films was also excited by linearly polarized 100 fs laser pulses [2]. Laser-pulse parameters tunable changes of magnetization precession both amplitude (as large as 20°) and frequency were observed.

Brillouin light scattering technique based results of our studies of spin waves propagation in patterned YIG will be also presented.

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