

Colloquium Notice

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Artificially structured materials for magneto-optical and microwave applications

Recently, it has been shown that magneto-optical Faraday and Kerr effects, as well as the magnetorefractive effect [1] can be significantly enhanced in magnetophotonic crystals (MPC) due to multiple interference and localization of light (see for review [2]). Besides, the influence of an applied magnetic field on the MPC photonic band structure opens a new way to control and manipulate the flow of light [3,4]. The same is true not only for visual light but in a wide range of spectrum, including near-IR and microwaves. The seminar will focus on some new possibilities to develop tunable by magnetic field optical and microwave devices, based on periodical magnetic structures. After a brief introduction into the field of magneto-optics and magnetophotonics the following recent results will be discussed (*i*) enhanced magneto-optical properties of magnetic granular alloys and discontinuous multilayers; (*ii*) the magnetorefractive effect in nanocomposites, manganites and multilayered structures; (*iii*) diluted magnetic semiconductors Si:Mn and TiO₂:Co as magneto-optical materials for tunable MPC; (*iv*) enhanced magneto-optics due to the Tamm states arising at the interface between MPC and non-magnetic photonic crystal; (*v*) magnetic superprism effect.

[1] A. Granovsky, M. Inoue, Journ. Magn. Magn. Mat. **272-276** (2004) E1601.

[2] M. Inoue, R. Fujikawa, A. Baryshev, A. Khanikaev, P.B. Lim, H. Uchida, O. Aktsipetrov, A. Fedyanin, T. Murzina, A. Granovsky, J. Phys. D: Applied Physics, **39** (2006) R151.

[3] A. Merzlikin, A. Vinogradov, M. Inoue, A. Granovsky, Phys. Rev. A, **72** (2005) 046603.

[4] A. Khanikaev, M. Inoue, A. Granovsky, Journ. Magn. Magn. Mat., **300** (2006) 104.

Monday

November 27, 2006

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326