Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Faraday effect of 1-D magnetic photonic crystals for normal and parallel incidence to the periodic direction Y. H. LU, M. D. HUANG, S. Y. PARK, P. J. KIM, Y. P. LEE, q-Psi and Dept. of Physics, Hanyang Univ., Seoul 133-791, Korea, J. Y. RHEE, BK21 Physics Research Division and Institute of Basic Science, Sungkyunkwan Univ., Suwon 440-746, Korea — We calculated the Faraday rotation of one-dimensional (1-D) magnetic photonic crystals (MPCs), which are based on the dielectric Ti_2O_3 and Al_2O_3, and the magnetic Bi:YIG, by employing 4 x 4 transfer-matrix method for the general case that the linearly polarized incident beam is parallel to their periodic direction, as mostly studied for the 1-D MPCs. Furthermore, even for a special case of normal incidence, the calculation of Faraday rotation was also carried out for such discontinuous thin films with a 1-D array structure and the existence of rotation was proved, which had been scarcely studied yet. The magneto-optical Faraday effects obtained for these two cases are compared and discussed in detail.

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Date submitted: 03 Dec 2005 Electronic form version 1.4