

Abstract Submitted  
for the DPP11 Meeting of  
The American Physical Society

**Magnetically Induced Transparency in Cold Magnetized Plasma  
by Spatially Periodic Magneto-static Field** RAANAN GAD, JOHN G.

LEOPOLD, AMNON FISHER, AMIRAM RON, Technion - Israel Institute of Technology — Electromagnetically Induced Transparency (EIT) is widely investigated. [1] EIT is a resonance absorption line made transparent due to destructive interference between two atomic transitions. A classical analog to quantum EIT is cold magnetized plasma, which resonantly absorbs electromagnetic radiation at the electron cyclotron frequency. Transparency is induced in such plasma by an additional magnetic field, constant in time and varying in space. [2] The proposed physical mechanism is the coupling of longitudinal plasma modulation to the transverse components of the electromagnetic radiation, canceling the forces acting on the plasma electrons. The plasma frequency and the electron cyclotron frequency are the classical analog of the atomic transition frequencies in quantum EIT. Controllable wave propagation parameters such as transmission amplitude and group velocity are some inherent features of MIT. Theoretical study and experimental results will be presented.

[1] K. J. Boller and S. Harris, Phys. Rev. Lett., 66, 2593 (1991).

[2] G. Shvets and J. S. Wurtele, Phys. Rev. Lett., 89, 115003 (2002).

Raanan Gad  
Technion - Israel Institute of Technology

Date submitted: 15 Jul 2011

Electronic form version 1.4