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SÉMINAIRE du SPP

Latest PVLAS results

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In the presence of an external magnetic field, vacuum behaves as an optically anisotropic medium. A linearly polarized light beam propagating transversely with respect to an external field will acquire an ellipticity. Induced ellipticity and dichroism can be linked with photon-photon scattering and with the production of light, neutral, scalar/pseudoscalar particles.

In this second hypothesis a direct ellipticity and dichroism measurement would lead to the determination of mass and coupling constant to two photons of the produced particles.

The PVLAS collaboration is operating a high-sensitivity (~$5 \cdot 10^{-7}$ $1/\sqrt{Hz}$) optical ellipsometer capable of detecting very small changes in the light polarization state induced by a strong transverse magnetic field. The apparatus is based on a high finesse (~100000), 6.4 m long Fabry-Perot (FP) optical resonator and on a 5.5 T superconducting, 1 m long, dipole magnet housed in a rotating cryostat. This ellipsometer is capable of measuring, using the heterodyne technique, both ellipticities and dichroisms in an independent way, down to levels below 10^{-8} rad, for about one hour of data taking time.

Until 2007 an unexpected signal both in rotation and ellipticity was present even in vacuum. Following the particle interpretation of these results, a direct regeneration measurement was designed. In parallel an upgrade to the whole apparatus was made. The latest results of the experiment will be presented along with the preparation of the direct appearance measurement setup.

Jeudi 11 octobre 2007 à 11 heures

Salle André Berthelot, bât. 141
Le café sera servi 15 minutes avant

NB : *La présentation d'une carte d'identité ou d'un passeport est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance de leur visite Emilie Chancrin, tél. 01 69 08 23 50 (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).*