Contribution ID: **34** Type: **not specified**

Birefringent photon spectrum from a nonlinear interaction with strong magnetic field

Thursday, 15 November 2012 15:55 (25 minutes)

In recent years, an extremely strong magnetic field, induced by colliding nuclei, has been attracting attention both from experimental and theoretical points of view. The magnitude of this magnetic field in RHIC and LHC is much stronger than the critical magnetic field, above which nonlinear interaction between charged particles (electrons, muons, etc) and the strong magnetic field becomes significant. Since the magnetic field decays rapidly as the
remnants of two nuclei receed, the nonlinear effects could be visible only in a very short period after the collision. Electromagnetic probes such as photons and leptons are believed to carry the information of the primordial matter in the collisions. However, such probes are themselves affected by the strong magnetic field which is also present just after the collision.Thus, to get the correct information, we have to quantitatively estimate to what extent the properties of probes are modified.

We have investigated how a photon spectrum is modified by the strong
magnetic field, on the basis of a rigorous theoretical calculation of the vacuum-polarization tenors in the presence of the external magnetic field. We will present implications to experiments, which include characteristic energy and azimuthal angle dependences of the direct photon spectrum.

Keywords

strong magnetic field, direct photon

Primary author: HATTORI, Koichi

Co-author: ITAKURA, Kazunori (KEK)

Presenter: HATTORI, Koichi

Session Classification: Parallel 2B (Chair Yongseok Oh)