ID contributo: **28** Tipo: **Invited talk**

Quasi-Cherenkov Parametric Radiation in a Photonic Crystal

lunedì 6 ottobre 2014 11:30 (30 minuti)

Parametric X-Ray radiation in natural crystals is well known [1-4]. The similar radiation mechanism arises when a charged particle moves in a photonic crystal [5, 6].

Quasi-Cherenkov parametric radiation in a photonic crystal is considered. The expressions for spectral-angular distribution of quasi-Cherenkov radiation emitted by a relativistic particle traversing a photonic crystal are derived. It is shown that for a relativistic particle, passing through a photonic crystal formed by periodically strained threads, the intensity of quasi-Cherenkov radiation emitted at small angles to the direction of particle motion, as contrasted to ordinary Cherenkov radiation, exhibits anisotropic properties as the photon momentum is rotated about the direction of particle motion (as the crystal is rotated about the direction of particle motion at fixed-angle observation of the outcoming photon).

The intensity of quasi-Cherenkov radiation in terahertz and optical ranges is shown to be high enough to allow the experimental study of quasi-Cherenkov radiation in these frequency ranges.

When passing through a photonic crystal, the particle bunches obtained at acceleration with ultra-intense and ultrashort laser pulses [7-9] are promising for the creation of a terahertz radiation source with significant power.

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