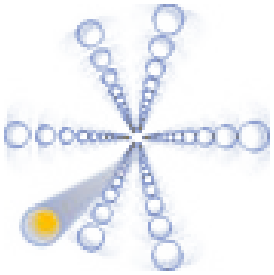

ID contributo: **97** Tipo: **Poster**

PS2-03: Physical and CST Modelling for THz Radiation of Electrons in Tube with Periodically Changing Internal Radius

martedì 7 ottobre 2014 17:00 (1O 30m)

Diffraction radiation (DR) occurs when a charged particle moves near the target. Smith-Purcell effect in DR, or Smith-Purcell radiation (SPR), is caused by periodicity of the target. Both DR and Smith-Purcell radiation have a lot in common with the widely known Cherenkov radiation (CR): all these types of radiation arise due to the polarization of the target material by the Coulomb field of moving electrons. In case of DR the target is not damaged, because electrons move near the target surface and do not cross edges of the target. On the one hand, this fact can be useful for creating powerful source of THz radiation based on chain of bunches moving inside the tube. On the other hand, the problem of calculation of radiation in targets with complicated surface is not that simple and numerical simulation can be of great use to simulate such problems taking into account all target geometry features.

In our article [Ponomarenko et al, NIMB 2013] we investigated theoretically radiation in THz frequency range in conditions when electrons move inside the hole with variable radius. It was demonstrated that contribution of Smith-Purcell radiation in case of periodical internal radius of the hole can be very good mechanism, more intensive then Cherenkov radiation or Smith-Purcell radiation from flat gratings. In this report we present simulation of radiation from hole with variable radius. The simulations are performed in Computer Simulation Technology (CST) Particle Studio (PS) software package. Simulation results are compared with analytical expressions and investigated for various parameters of the target.

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Classifica Sessioni: PS: Poster Session