

Radiation from Relativistic Electrons in Periodic Structures "RREPS-23" & Electron, Positron, Neutron and X-ray Scattering under External Influences "Meghri-23"



Contribution ID: 133

Type: Oral

## Peculiarities of Spectral-Angular Distribution of Coherent Radiation by a Train of Electron Bunches Crossing a Conducting Ball

Monday 18 September 2023 15:40 (20 minutes)

The spectral-angular distribution of the coherent radiation by a train of electron bunches crossing a conducting ball is theoretically studied. The work is based on the corresponding exact analytic solutions of Maxwell's equations. The generalized Drude-Lorentz-Sommerfeld formula for the dielectric function of material of the ball is used in numerical calculations. It is shown that peaks in the radiation spectrum of the train may appear at some "resonance frequencies". Those peaks disappear in the geometry where the ball is replaced by a plane-parallel plate made of the same material and having a thickness equal to the diameter of the ball. A visual explanation of this phenomenon is given and its possible practical applications are discussed.

The work was partially supported by the Science Committee of RA, in the frames of the research project № 21AG-1C069.

**Authors:** SARGSYAN, Anush (Institute of Applied Problems of Physics NAS RA); Prof. SAHARIAN, Aram; MKRTCHYAN, Artak (I); Mr HARUTYUNYAN, Hayk (Institute of Applied Problems of Physics NAS RA); KHACHATRYAN, Hrant (Institute of Applied Problems of Physics National Academy of Sciences of Armenia); GRIGORYAN, Levon (Institute of Applied Problems of Physics NAS RA); GRIGORYAN, Mher (I); Prof. ALEKSANDROV, Petr (National research centre "Kurchatov institute" Moscow, Russia); WAGNER, Wolfgang (HZDR Dresden)

**Presenter:** SARGSYAN, Anush (Institute of Applied Problems of Physics NAS RA)

**Session Classification:**  $e^-/e^+$  beams interaction in solids

**Track Classification:**  $e^-/e^+$  beams interaction in solids: General Properties of Radiation from Relativistic Particles