

Channeling 2018



Contribution ID: 75

Type: **Oral presentation**

Features of Radiation Generated by Bunches of Charged Particles Passing Through the Centre of a Ball

Tuesday, 25 September 2018 10:45 (15 minutes)

The radiation generated by a rectilinearly and uniformly moving train of fine bunches of charged particles is investigated. It is assumed that the particles cross a ball made of conductive, dielectric or composite material passing through its center. The obtained numerical results are based on the corresponding exact analytical solutions of Maxwell equations [1,2].

It is shown that there may be peaks in the emission spectrum of particles at some “specific frequencies” with the wavelengths of the order of ball radius. The values of the spectral density of radiated energy at these specific frequencies may be many times larger than the values of that quantity at adjacent frequencies. The peaks in the spectrum of radiation generated by the particles disappear if one replaces the ball by a plane-parallel plate made of the same materials, with a thickness equal to the diameter of the ball. A visual explanation of this phenomenon is given.

References

1. S.R. Arzumanyan, L.Sh. Grigoryan and A.A. Saharian, *Izv. Nats. Akad. Nauk Arm., Fiz. (Engl. Transl.: J. Contemp. Phys.)* 30 (1995) 99.
2. S.R. Arzumanyan, *J. Phys.: Conf. Ser.* 357 (2012) 012008.

Primary authors: Prof. MKRTCHYAN, Alpik (Institute of Applied Problems of Physics NAS RA); Dr MKRTCHYAN, Artak (Institute of Applied Problems of Physics NAS RA); Prof. GRIGORYAN, Levon (Institute of Applied Problems in Physics); Dr ALEKSANDROV, Petr (National Research Center “Kurchatov Institute”)

Co-authors: Ms SARGSYAN, Anush (Institute of Applied Problems of Physics NAS RA, 25 Hr. Nersessian St., Yerevan, Armenia); Dr KHACHATRYAN, Hrant (Institute of Applied Problems in Physics)

Presenter: Prof. MKRTCHYAN, Alpik (Institute of Applied Problems of Physics NAS RA)

Session Classification: S2.3 Channeling & Radiations in Various Fields