Radiation from Relativistic Electrons in Periodic Structures "RREPS-15"



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## Polarization Bremsstrahlung of Fast Electrons on Metallic Nanospheres in Dielectric Matrix with Account for Plasmonic Interference Effects

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The presentation is devoted to theoretical analysis of Polarization Bremsstrahlung (PBrS) [1] due to the scattering of fast electrons on metallic nanosphere embedded in dielectric matrix in frequency region near dipole and quadrupole plasmon resonances. Here we account for plasmonic interference effects which arise in frequencyangular distribution of PBrS. These effects are the consequence of interrelation between contributions in PBrS due to plasmon on sphere surface with different multipolarity. Our approach is based on the Fermi method of equivalent photons [2] and Mie theory of radiation scattering on small metallic particles [3].

It is shown that the account for plasmonic interference in PBrS differential cross section leads to specific features in spectral distribution of emitted photon which strongly depend on radiation angle, nanosphere radius and dielectric permittivity of matrix.

References

1. Astapenko V. Polarization Bremsstrahlung on atoms, plasmas, nanoscructures and solids. Springer. 2013. 374 p.

2. Fermi E. Uber die Theorie des Stossen zwishen Atomen und electrisch geladenen Teilchen. Z. Phyzik, v.29, p.315 (1924)

3. Van de Hulst H.C. Light scattering by small particles. NY: Dover Publications, 1981, 470 p.

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