

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



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Generation of Surface Polaritons on Cylindrical Interfaces

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The radiation of surface polaritons by charged particles moving inside or outside a cylindrical dielectric waveguide is discussed. It is assumed that the waveguide is immersed in a homogeneous medium. As an active medium, supporting the propagation of surface polaritons, both the cases of interior and exterior media are considered. The radiation fields are explicitly separated in both those media and their behavior is investigated in asymptotic regions. For a charged particle moving parallel to the axis of the cylinder, the energy fluxes are evaluated through the plane perpendicular to the waveguide axis. It is shown that in the active medium (with negative real part of dielectric permittivity) the energy flux for surface polaritons is oppositely directed with respect to the particle motion, whereas in the medium with positive dielectric permittivity the energy flux is directed towards the particle motion.

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