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PS2-07: The Radiation from a Charge Moving along a Helical Trajectory with an Arbitrary Cross section

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We investigate the radiation intensity for a charged particle moving along a helical trajectory with an arbitrary cross section around a dielectric cylinder immersed into a homogeneous medium. The corresponding formulae generalize our previous results for the special case of a coaxial circular orbit. For the latter geometry, under certain conditions for the charge velocity and dielectric permittivity of the cylinder, strong narrow peaks appear in the angular distribution of the radiation intensity in the exterior medium. We discuss the influence of the shift of the charge motion from the circular one on the characteristics of the radiation peaks. As an application of general formulae we consider the radiation from a charged longitudinal oscillator moving along a coaxial circular helix. It is shown that the presence of oscillations essentially influences the radiation intensity compared with the case of synchrotron radiation.

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