

Channeling 2018



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The Influence of Medium Polarization Inhomogeneity on the Channeling Radiation from a Positron Bunch

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Channeling positrons of a bunch oscillate with equal frequencies, but with different amplitudes in a harmonic potential of a planar channel. That is, the positron bunch radiation generates in a medium with polarization inhomogeneity.

Within the framework of the Thomas-Fermi statistical model, the electron density distribution, depending on the transverse coordinate of a channel, is obtained.

An analytic expression for the spectral distribution of the total radiation of a positron bunch is deduced. It essentially depends on both the bunch energy and the medium polarization inhomogeneity, especially in the soft frequency range. A comparison with the experimental data is made.

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