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Abstract. The motion of channeling particles in the accompanying coordinate system can be considered as one-dimensional oscillator (in the case of planar channeling) or as a two-dimensional atom (in the case of axial channeling) [1-5]. The transversal motion of the channeling particles is characterized by discrete spectrum. The occupation probability of the transversal motion levels depends on the entrance angle of charged particle relative to the crystallographic axis. Passing through the single crystal the charged channeling particle undergoes periodic impact of the lattice atoms [2,6,7] with the main frequency ω= γ v(d,) where is the lattice constant, and γ=E(mc^2) are the speed and the Lorentz-factor of the channeling particle [2]. If an external periodic action frequency coincides with the transition frequency of the channeling particles from one quantized state of transversal motion in another, then the resonant excitation of channeling particles is possible. This effect is analogous with the excitation of the atomic electrons by the periodic field of monochromatic electromagnetic waves [7-9]. The resonance conditions are discussed and the dependence of the occupation probability of the transversal motion levels of the channeling particles (electrons) upon the single crystal thickness is analyzed.

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