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Angular Distribution Features of the Cherenkov Radiation at the Channeling in the Optical Range

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It is shown that electrons channeled along the (220) planes of the crystal C (diamond), the radiation in the energy range (1.5,12.5) eV is the Cherenkov radiation at the channeling - ChRC (ChRC-photons) which should be nonuniform in the azimuthal angular distribution. These features of the angular distribution of the channeling radiation (CR) from channeled relativistic electrons (optical range) arise due to interband and intraband transitions between transverse motion quantum states of the electrons at the planar channeling in medium with dispersion ($n > 1$). Based on the features of the accelerator SAGA LS (Japan), we have carried out calculations for the CR from relativistic electrons with $\gamma = 500$. Nonetheless, our calculations have shown that for relativistic electrons with $\gamma \in (20 \dots 500)$ the features of azimuthal angular distribution of ChRC remain the same.

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