PLANAR AND AXIAL CHANNELING OF RELATIVISTIC ELECTRONS IN HALF-WAVE SILICON CRYSTAL AND CORRESPONDING RADIATION

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Half-wavelength crystal (HWC) is a thin crystal, when a channeled particle experiences only one collision with crystallographic plane during its motion through a HWC crystal. Recently, the authors of Ref. [1] experimentally demonstrated that planar channeled 2 MeV protons were successfully mirrored by a thin silicon HWC. In continuation of this work, the mirroring effect was observed at very high energy at CERN-SPS [2].

In Ref. [3] we performed the detailed experimental investigations and computer simulations of channeling of 255 MeV electrons in the 1 μm thickness silicon HWC. Here, we present new experimental data on planar and axial channeling of 255 MeV electrons in a 0.7 μm Si HWC resently obtained at SAGA LS Facility and comparison with computer simulations. The angular distribution of electrons after penetration through the HWC crystal revealed the number of peculiarities. Also we present calculated radiation spectra from electrons channeled in HWC and compare that with radiation spectra of electrons moving in an arc [4] (never studied experimentally).

References

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