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Angular-of-incidence Dependence of Total Yield of Channeling Radiation from Relativistic Electrons in Thin Si and C Crystals

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The total yield of the radiation from ultra-relativistic 150 GeV electrons and positrons was estimated by semi-classical Baier-Katkov method in [1] and for 1 GeV electrons in the framework of classical electrodynamics in [2]. Angle-of-incidence dependence of the total yield of channeling radiation (CR) from 155-855 MeV electrons in Si and W was considered in [3] using developed code [4]. Also the possibility to use angle-of-incidence dependence of the total yield of CR for the alignment of thin Si and W crystals and initial angular divergence of the particle beam was suggested in [3].

Here we consider the angle-of-incidence dependence of the total yield of CR from 255 MeV electrons at <100>-axial, (100) and (111) planar channeling in 0.7 and 20 μm Si and 50 μm C crystals. Simulation are performed in connection with the experimental program on the interaction of electrons with crystals at linear accelerator of SAGA Light Source (Tosu, Saga, Japan) [5].

References

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