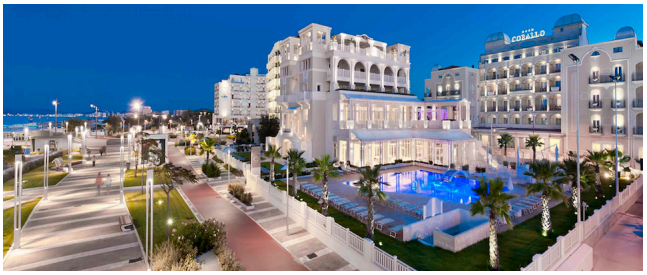

Contribution ID: **27** Type: **poster**

Orbital Angular Momentum of Axial Channeling Radiation from Relativistic Electrons in Thin Si Crystal

Monday, 5 June 2023 18:19 (1 minute)

The twisted photon is the electromagnetic wave carrying the orbital angular momentum (OAM). Various schemes of production of the twisted photons have been proposed recently. The undulators and free electron lasers are used in these schemes. High energy twisted photons can also be generated by parti-cles channeled in aligned crystals.
In our previous work We described planar channeling radiation from electrons in terms of twisted photons. We calculated the energy spectrum of twisted photons and the dependence of the projection of total angular momentum on the radiation angle.
The calculations were performed for electrons channelled in (220) Si crystal. The crystal thickness was L = 20 μm. The energy of electrons was 255 MeV (the Lorenz factor γ=500). The calculations reveal that the pro-jection of total angular momentum oscillates and the distance between the maxima is of the order 25-30 keV. At present time, we do not have a precise explanation of this fact. This effect may be a manifestation of periodicity in m of the undulator radiation probability in the case when the detector axis does not coincide with the undulator axis.
In this work, we plan to perform the same calcu-lation for the case of axial channelling and check whether the periodical dependence remains intact or dis-appears.

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Session Classification: PS: Poster Session