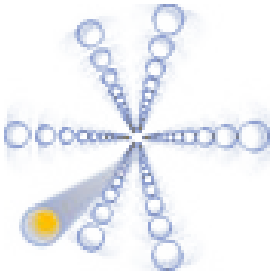

Contribution ID: **77** Type: **Oral**

Interference Effects in the Radiation of the Relativistic Electron in the Structure of "Amorphous Matter Layers - Single Crystal"

Tuesday, 7 October 2014 17:15 (15 minutes)

In the present work a theory of coherent radiation of a relativistic electron moving at a constant speed in a combined target, consisting of several amorphous matter layers and a monocrystalline layer is built. The expressions describing the amplitudes of diffracted transition radiation (DTR) and parametric X-ray radiation (PXR) are derived in the framework of two-wave approach of the dynamic diffraction theory. The cases of the one and two amorphous substance layers in the structure were considered. Also the extreme case is investigated, when vacuum is considered as the second amorphous layer in the structure. The expressions obtained describe a spectral-angular distribution of DTR, PXR and theirs interference in such a structure. The X-Ray wave generation and propagation processes in crystalline layer are considered in Laue scattering geometry for the general case of asymmetric reflection. The expression of DTR spectral-angular density contains the summands describing the contributions of the transition radiation (TR) on surfaces of amorphous layer and on the boundary of vacuum-crystal, and their interference.
The possibility of substantial increase of the DTR spectral-angular density because of constructive interference of TR waves generated on the above mentioned boundaries is shown.

Primary author: Prof. BLAZHEVICH, Sergey (Belgorod National Research University)

Co-authors: Prof. NOSKOV, Anton (Belgorod National Research University); Mr ZAGORODNYUK, Roman (Belgorod National Research University)

Presenter: Prof. BLAZHEVICH, Sergey (Belgorod National Research University)

Session Classification: S1: Channeling & Radiations in Crystals