

**Radiation from Relativistic Electrons in Periodic Structures "RREPS-23" & Electron, Positron, Neutron and X-ray Scattering under External Influences
"Meghri-23"**



Contribution ID: 178

Type: **Oral**

The far field diffraction of a plane wave on a system of randomly and in average periodically located point scatterers: the Debye-Waller factor.

Friday 22 September 2023 09:40 (20 minutes)

In the framework of the report we discuss the description problem of a diffracted plane wave incident on system of randomly and in average periodically located scatterers. We suggest that the scatterers under the action of the prime field are appeared as sources of secondary sphere waves. The problem is considered in the Fraunhofer approximation.

Following the traditional approach, here we also assume that the random components of the problem are small quantities. At the same time, in contrast to the traditional approach, where the description of the diffraction pattern is given on the basis of field averaging (see C. Kittel, Introduction to solid state physics (Wiley & Sons, NY, 2005)), here the diffraction pattern is considered on the basis of intensity averaging. The above, in particular, refers to the influence of inhomogeneity on the values of intensity of the main maximums for an ideal structure, which, as it is known, in the traditional approach is determined by the factor Debye-Waller.

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Session Classification: e^-/e^+ , X-ray, THz, and neutron based applications