Contribution ID: **7** Type: **Poster**

Resonance Interaction of the Laser Radiation with thin Structure of axial channeling particles energy levels

Monday, 26 September 2016 18:40 (1 hour)

In the recent publication [1] the authors had considered the resonance interaction of the laser radiation with ultra-relativistic electrons in planar channeling regime. The idea of the effect was simple: even though the distances between energy levels of channeled electrons and the energies of laser photons may belong to different ranges the Doppler effect bring may help them to match each other when a laser beam is directed right in opposite direction than an electron beam. The same effect is possible also in axial channeling regime. But due to spin-orbital interaction there is also another possibility. The splitting of axial channeling energy levels due to spin-orbital interaction is not large ($\Delta E \sim 10\text{-}4eV$), but the Doppler effect may help the optical laser radiation to match with this splitting in case if the laser beam is directed in the same direction as the electron beam. The possibility and conditions under which it may be to observe this effect, which may result in reemitting of resonantly captured photons with higher energies (due to the Doppler effect) are considered.
References:
1. Kalashnikov N.P., Olchak A.S., Khangulian E.V. Radiation from Channeling Electrons, Stimulated by Laser Beam. Nuclear Instruments and Methods. NIM B309, p.p. 67-69. 2013. ref. number NIMB59336

Summary

The conditions are considered, under which it may be possible to observe the effect of resonance interraction between laser radiation and splitted due to spin-orbital interractions axial channeling quantum states.

Primary authors: Dr OLCHAK, Andrey (MEPhI, Russia); Prof. KALASHNIKOV, Nikolay (National Research Nuclear University Mephi)

Presenter: Prof. KALASHNIKOV, Nikolay (National Research Nuclear University Mephi)

Session Classification: PS1: Poster Session