RADIATION FROM RELATIVISTIC ELECTRONS IN "LIGHT UNDULATOR" AND IN CONVENTIONAL UNDULATOR. QUANTUM AND CLASSICAL APPROACHES

Alexander Potylitsyn[a,1], ***Anatoly Kolchuzhkin***[b]

[a] *National Research Tomsk Polytechnic University, Tomsk, Russia*
[b] *State University of Technology Stankin, Moscow, Russia*

The Thomson scattering of laser photons by a relativistic electron can be considered as radiation in a "light undulator". Classical formulas describing characteristics of the conventional undulator radiation (UR) are applicable for the radiation in a "light undulator" if it is possible to neglect by recoil effect.

In the opposite case the discrete quantum processes of photon emission in each interaction of an electron with laser photons have to be considered in terms of cross-section (the Compton scattering process).

We have showed that quantum and classical approaches give the same results for a conventional undulator that allows to use the stochastic description of UR in a complete analogy with simulation of Compton/Thomson photon sources.

[1] Corresponding author: potylitsyn@tpu.ru