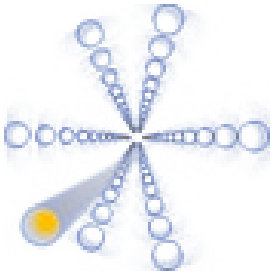

Contribution ID: **53** Type: **Oral**

Collective Parametric (Quasi-Cherenkov) Radiation from Quantum Noise

Parametric (quasi-Cherenkov)radiation mechanism utilizes crystal periodicity, which provides Cherenkov condition for wave synchronism with electron beam and, simultaneously, two-wave(or multi-wave) distributed feedback. As result, generation process can develop on shorter "beam - wave" interaction length. This mechanism was proposed earlier as the candidate for XFEL generation [1, 2]. The present work considers dynamics of quasi-Cherenkov radiation, beginning from quantum noise, on the base of dynamics of quantum field creation/annihilation operator. Modified by dynamical Bragg diffraction dependence of intensity on length and other features of collective quasi-Cherenkov radiation are theoretically studied.
[1] Baryshevsky V.G. and Feranchuk I.D Parametric beam instability of relativistic charged particles in a crystal. Phys.Lett. 102A (1984) 141.
[2] Baryshevsky V.G., Batrakov K.G., Dubovskaya I.Ya. Parametric (quasi-Cerenkov) X-ray free electron lasers. Journal of Physics D 24. N 8 (1991) 1250.

Baryshevsky V.G., Batrakov K.G., Dubovskaya I.Ya. PARAMETRIC (QUASI-CERENKOV) X-RAY FREE ELECTRON LASERS Journal of Physics D: Applied Physics. 1991, V. 24. № 8, 1250-1257.

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