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Coherent radiation characteristics of microbunched electron bunch formed in the stack of the two plates

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The radiation in stack of the two plates of the electron bunch, microbunched in SASE FEL process, was investigated. Frequency-angular distribution of the radiation consists of two factors: the bunch form-factor around the resonant frequency and the radiation distribution formed by the passage of a single electron through a stack of plates. The region of radiated frequencies l both above and below has lower and upper limits due to the medium polarization. The radiation coherence is not inhibited from a transverse form-factor if the resonance frequency is close to the lower limit frequency. Although the probability of transition radiation is small but due to the coherence effect its intensity can be of the order of SASE FEL intensity. Herewith the line width shrinks by several orders. Experimental study of the phenomenon will determine the value of modulation depth parameter of the bunch also.

Primary author: Mr GEVORGYAN, Hayk (Student)

Co-author: Prof. GEVORGIAN, Lekdar (Leading Researcher)

Presenter: Mr GEVORGYAN, Hayk (Student)

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