

**PIC CODE KARAT SIMULATIONS OF COHERENT THZ SMITH-PURCELL RADIATION FROM DIFFRACTION GRATINGS OF VARIOUS PROFILES**

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Generation of coherent THz Smith-Purcell radiation by single electron bunch or multi-bunched electron beam was simulated for lamellar, sinusoidal and echelette gratings. The dependences of the CSPR intensity of the corrugation gratings depth were investigated. The angular and spectral characteristics of the CSPR for different profiles of diffraction gratings were obtained. It is shown that in the case of femtosecond multi-bunched electron beam with 10 MeV energy sinusoidal grating with period 292  $\mu\text{m}$  and groove depth 60  $\mu\text{m}$  has the uniform angular distribution with high radiation intensity.

***Keywords:*** *Coherent THz radiation, Smith-Purcell radiation, PiC simulation.*