Joint DESY and University of Hamburg Accelerator Physics Seminar

Tuesday, 13.06.2017

(16:00 in Room 459/30b)

Generation of High–Power, Tunable THz Radiation from Laser Interaction with a Relativistic Electron Beam

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Abstract

We propose a method based on the slice energy spread modulation to generate strong subpicoseond density bunching in high–intensity relativistic electron beams. A laser pulse with periodic intensity envelope is used to modulate the slice energy spread of the electron beam, which can then be converted into density modulation after a dispersive section. It is found that the double–horn slice energy distribution of the electron beam induced by the laser modulation is very effective to increase the density bunching. Since the modulation is performed on a relativistic electron beam, the process does not suffer from strong space charge force or coupling between phase spaces, so that it is straightforward to preserve the beam quality for terahertz (THz) radiation and other applications. We show in both theory and simulations that the tunable radiation from the beam can cover the frequency range of 1—20 THz with high power and narrow-band spectra, and discuss recent experimental studies of this scheme.

SORRY FOR THE SHORT NOTICE!

W.Hillert, (Univ. HH), I.Agapov (MPY) and M.Vogt (MFL).

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