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Title

Observation of coherently enhanced tunable narrow-band terahertz transition radiation from a relativistic sub-picosecond electron bunch train

Source

Applied Physics Letters, vol.98, no.26, 27 June 2011, 261501 (3 pp.). Publisher: American Institute of Physics, USA.

Abstract

We experimentally demonstrate the production of narrow-band (f/f20% at f0.5THz) transition radiation with tunable frequency over [0.37, 0.86] THz. The radiation is produced as a train of sub-picosecond relativistic electron bunches transits at the vacuum-aluminum interface of an aluminum converter screen. The bunch train is generated via a transverse-to-longitudinal phase space exchange technique. We also show a possible application of modulated beams to extend the dynamical range of a popular bunch length diagnostic technique based on the spectral analysis of coherent radiation. (24 References).