355.
Accession number:20112814139665
Title:Observation of coherently enhanced tunable narrow-band terahertz transition radiation from a relativistic sub-picosecond electron bunch train
Authors:Piot, P. (1); Sun, Y.-E. (2); Maxwell, T.J. (1); Ruan, J. (3); Lumpkin, A.H. (3); Rihaoui, M.M. (1); Thurman-Keup, R. (3)
Author affiliation:(1) Northern Illinois Center for Accelerator and Detector Development, Department of Physics, Northern Illinois University, DeKalb, IL 60115, United States; (2) Accelerator Physics Center, Fermi National Accelerator Laboratory, Batavia, IL 60510, United States; (3) Accelerator Division, Fermi National Accelerator Laboratory, Batavia, IL 60510, United States
Corresponding author:Piot, P.(piot@nicadd.niu.edu)
Source title:Applied Physics Letters
Abbreviated source title:Appl Phys Lett
Volume:98
Issue:26
Issue date:June 27, 2011
Publication year:2011
Article number:261501
Language:English
ISSN:00036951
CODEN:APPLAB
Document type:Journal article (JA)
Publisher:American Institute of Physics, 2 Huntington Quadrangle, Suite N101, Melville, NY 11747-4502, United States
Abstract: We experimentally demonstrate the production of narrow-band ($\delta f/f \simeq20$% at $f\simeq 0.5$ THz) THz 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. 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.
Number of references:26