

54

Accession number:20115114609352

Title:Multimode terahertz-wave generation using coherent Cherenkov radiation

Authors:Kan, K. (1); Yang, J. (1); Ogata, A. (1); Kondoh, T. (1); Norizawa, K. (1); Yoshida, Y. (1)

Author affiliation:(1) Institute of Scientific and Industrial Research (ISIR), Osaka University, 8-1 Mihogaoka, Ibaraki, Osaka 567-0047, Japan

Corresponding author:Kan, K.(koichi81@sanken.osaka-u.ac.jp)

Source title:Applied Physics Letters

Abbreviated source title:Appl Phys Lett

Volume:99

Issue:23

Issue date:December 5, 2011

Publication year:2011

Article number:231503

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:Multimode terahertz(THz)-wave generation using coherent Cherenkov radiation (CCR) was investigated. The frequency spectra of CCR, which utilized a metal-wrapped hollow dielectric tube of 7 mm outer radius and a picosecond electron bunch of 27 MeV beam energy, were measured by a Michelson interferometer with a 4.2 K silicon bolometer. In this study, discrete spectral components at frequencies of 0.09, 0.14, and 0.36 THz were observed experimentally and explained as transverse magnetic (TM) modes of TM<sub>03</sub>, TM<sub>04</sub>, and TM<sub>09</sub>, respectively, according to a theoretical calculation for the tube.

Number of references:24