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Accession number:13136316

Title:Terahertz generation in quasi-phase-matching structure formed by a phase mask

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Source title:Optics Letters

Abbreviated source title:Opt. Lett. (USA)

Volume:37

Issue:19

Publication date:1 Oct. 2012

Pages:4155-7

Language:English

ISSN:0146-9592

CODEN:OPLEDP

Document type:Journal article (JA)

Publisher:Optical Society of America

Country of publication:USA

Material Identity Number:EV60-2012-008

Abstract:It is theoretically shown that application of a phase mask in optical rectification scheme is equivalent to spatial modulation of the crystal's nonlinear coefficient in cross-section plane of the laser beam. It allows using the technique of quasi-phase-matching for efficient noncollinear terahertz (THz) generation by using high-power wide-aperture optical beam. According to calculations, the linewidth of THz generation can be varied from 10 GHz to a few THz by changing the optical beam size. It is shown that the frequency of THz generation can be also tuned by building the image of the phase mask in the crystal with variable magnification.

Number of references:16

Inspec controlled terms:laser beams - optical phase matching - terahertz wave generation

Uncontrolled terms:quasi-phase-matching structure - phase mask - optical rectification scheme - spatial modulation - nonlinear coefficient - cross-section plane - laser beam - noncollinear terahertz generation - high-power wide-aperture optical beam - frequency 10 GHz

Inspec classification codes:A4265 Nonlinear optics - A4260H Laser beam characteristics and interactions - B4340 Nonlinear optics and devices - B4330 Laser beam interactions and properties

Numerical data indexing:frequency 1.0E+10 Hz

Treatment:Practical (PRA)

Discipline:Physics (A); Electrical/Electronic engineering (B)

DOI:10.1364/OL.37.004155

Database:Inspec

IPC Code:G02F1/35Copyright 2012, The Institution of Engineering and Technology