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标题: Tunable terahertz parametric oscillator synchronously-pumped by mode-locked picosecond Ti:Sapphire laser with MgO-doped LiNbO3
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来源出版物: NONLINEAR FREQUENCY GENERATION AND CONVERSION: MATERIALS, DEVICES, AND APPLICATIONS XI??丛书: Proceedings of SPIE??卷: 8240??文献号: 82401K??DOI: 10.1117/12.907886??出版年: 2012??
在 Web of Science 中的被引频次: 0
被引频次合计: 0
引用的参考文献数: 15
摘要: A terahertz (THz) parametric oscillator (TPO), which was based on the optical parametric process, in a doubly-resonant external enhancement cavity synchronously-pumped by a mode-locked picosecond Ti:sapphire laser with the center wavelength of 780 nm and the average output power of 850 mW, was built. Our TPO cavity including four mirrors and a 5 mol% MgO-doped LiNbO3 (MgO: LN) crystal with Si-prism couplers for the output coupling of the THz wave was designed so as to circulate both pump and idler waves in the same cavity simultaneously. Furthermore, we utilized a Hansch-Couillaud method to stabilize the cavity. As a result, we developed an easily and continuously tunable picosecond TPO by changing the noncollinear phase-matching condition. The tunable wavelength range of the idler wave was from 782 to 787 nm, which corresponded to the THz frequency range from 1.0 to 3.4 THz according to the law of energy conservation. In addition, the measured angle between the pump and idler waves, which varied from 0.6 to 2.5 degrees, showed a good agreement with the theoretical calculation of the noncollinear phase-matching condition in all the above tuning range.
入藏号: WOS:000302636900034
语种: English
文献类型: Proceedings Paper
会议名称: Conference on Nonlinear Frequency Generation and Conversion - Materials, Devices, and Applications XI
会议日期: JAN 24-26, 2012
会议地点: San Francisco, CA
会议赞助商 : SPIE
作者关键词: terahertz (THz) wave; MgO-doped LiNbO3 (MgO:LN); external enhancement cavity; mode-locked picosecond Ti:sapphire laser; optical parametric process; tunable terahertz parametric oscillator (TPO); noncollinear phase-matching condition
KeyWords Plus: PRISM COUPLER; SPECTROSCOPY; RADIATION; CAVITY
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出版商: SPIE-INT SOC OPTICAL ENGINEERING
出版商地址: 1000 20TH ST, PO BOX 10, BELLINGHAM, WA 98227-0010 USA

Web of Science 分类: Optics
学科类别: Optics
IDS 号: BZR75
ISSN: 0277-786X
ISBN: 978-0-8194-8883-1
29 字符的来源出版物名称缩写: PROC SPIE
来源出版物页码计数: 6