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Title:High-powered tunable terahertz source based on a surface-emitted terahertz-wave parametric oscillator
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Abstract:A high-powered pulsed terahertz (THz)-wave has been parametrically generated via a surface-emitted THz-wave parametric oscillator (TPO). The effective parametric gain length under the noncollinear phase matching condition was calculated for optimization of the parameters of the TPO. A large volume crystal of MgO:LiNbO<inf>3</inf> was used as the gain medium. THz-wave radiation covering a frequency range from 0.87 to 2.73 THz was obtained. The average power of the THz-wave was 9.12 μW at 1.75 THz when the pump energy was 94 mJ, corresponding to an energy conversion efficiency of about 9.7 × 10 ⁻⁶ and a photon conversion efficiency of about 0.156%. The THz-wave power in our experiments is high enough for practical applications to spectrum analysis and imaging. © 2012 Society of Photo-Optical Instrumentation Engineers (SPIE).
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Uncontrolled terms:Average power - Frequency ranges - Frequency-tuning - Gain medium - MgO:LiNbO - Non-collinear phase-matching - Parametric gain - Photon conversion efficiencies - Pump energies - Terahertz - Terahertz sources - Terahertz-wave parametric oscillators
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