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Title:Efficient Cherenkov-type terahertz generation in Si-prism-LiNbO <inf>3</inf>-slab structure pumped by nanojoule-level ultrashort laser pulses
Authors:Bakunov, M.I. (1); Mashkovich, E.A. (1); Tsarev, M.V. (1); Gorelov, S.D. (1)
Author affiliation:(1) University of Nizhny Novgorod, Nizhny, Novgorod 603950, Russia
Corresponding author:Bakunov, M.I.(bakunov@rf.unn.ru)
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Abstract:We demonstrate, both theoretically and experimentally, that a sandwich-type structure consisting of a thin LiNbO<inf>3</inf> slab and Si prism outcoupler can be an efficient convertor of unamplified laser pulses into broadband terahertz radiation. Pumping a 1 cm long sandwich structure with a 35 μm thick LiNbO<inf>3</inf> slab by 8 nJ, 100 fs optical pulses from Ti:sapphire oscillator we achieved the conversion efficiency of 0.8 × 10⁻⁴, i.e., two orders of magnitude higher than in the conventional generation scheme with ZnTe crystal. Using laser oscillator as a pump has an advantage of high repetition rate and, therefore, potentially high signal-to-noise ratio (∼50 dB in our experiment). © 2012 American Institute of Physics.
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Controlled terms:Conversion efficiency - Fading (radio) - Prisms - Sapphire - Silicon - Terahertz waves - Ultrashort pulses - Zinc compounds
Uncontrolled terms:Broadband terahertz - Conventional generation - High repetition rate - High signal-to-noise ratio - Laser oscillators - Orders of magnitude - Slab structures - Terahertz generation - Ti:sapphire oscillators - ZnTe crystal
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