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标题: Coherent electro-optical detection of THz-wave generated from synchronously pumped picosecond THz parametric oscillator
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摘要: Terahertz (THz) radiation via parametric down-conversion of optical pulses in a nonlinear optical crystal is an attractive way to develop frequency tunable THz-wave sources. Therefore, we have focused on developing low-laser-power-pumped THz-wave parametric sources and then successfully demonstrated a synchronously-pumped picosecond THz parametric oscillator (TPO) in pump-enhanced idler-resonant cavity with a bulk 5 mol% MgO-doped lithium niobate (MgO:LN) crystal. In this paper, toward coherent electro-optical (EO) detection of THz waves generated from our synchronously pumped picosecond TPO, we reported time-domain measurements of the THz electric fields using a bowtie-shaped low-temperature grown gallium arsenide (LT-GaAs) photoconductive (PC) antenna as a THz detector. As a result, we obtained temporal waveforms of the THz electric pulses, for the different number of Si-prism couplers, and then found that the radiated THz waves separated multiple unanticipated pulses by use of the arrayed-prism coupling technique. Also, we compared the time-domain system with a Fourier transform Michelson interferometer using a high-resistance silicon (Si) beam splitter, from the some viewpoints. The present results reveal great prospects for the realization of THz spectroscopy and imaging applications using our THz-wave source.
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