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标题: Bandwidth tunable THz wave generation in large-area periodically poled lithium niobate
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摘要: A new scheme of optical rectification (OR) of femtosecond laser pulses in a periodically poled lithium niobate (PPLN) crystal, which generates high energy and bandwidth tunable multicycle THz pulses, is proposed and demonstrated. We show that the number of the oscillation cycles of the THz electric field and therefore bandwidth of generated THz spectrum can easily and smoothly be tuned from a few tens of GHz to a few THz by changing the pump optical spot size on PPLN crystal. The minimal bandwidth is 17 GHz that is smallest ever of reported in scheme of THz generation by OR at room temperature. Similar to the case of Cherenkov-type OR in single-domain LiNbO3, the spectrum of THz generation extends from 0.1 THz to 3 THz when laser beam is focused to a size close to half-period of PPLN structure. The energy spectral density of narrowband THz generation is almost independent of the bandwidth and is typically 220 nJ/THz for similar to 1 W pump power at 1 kHz repetition rate. (C) 2012 Optical Society of America
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