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Title:Towards generation of mJ-level ultrashort THz pulses by optical rectification

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Abstract:Optical rectification of ultrashort laser pulses in LiNbO<sub>3</sub> by tilted-pulse-front excitation is a powerful way to generate near single-cycle terahertz (THz) pulses. Calculations were carried out to optimize the output THz peak electric field strength. The results predict peak electric field strengths on the MV/cm level in the 0.3-1.5 THz frequency range by using optimal pump pulse duration of about 500 fs, optimal crystal length and cryogenic temperatures for reducing THz absorption in LiNbO<sub>3</sub>. The THz electric field strength can be increased further to tens of MV/cm by focusing. Using optimal conditions together with the contact grating technique THz pulses with 100 MV/cm focused electric field strength and energies on the tens-of-mJ scale are feasible.

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