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Title:Effects of two-photon absorption on Terahertz radiation generated by femtosecond-laser excited photoconductive antennas
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Abstract:Terahertz (THz) radiation can be generated more efficiently from a low-temperature-grown GaAs (LT-GaAs) photoconductive (PC) antenna by considering the two-photon absorption (TPA) induced photo-carrier in the photoconductor. A rate-equation-based approach using the Drude-Lorentz model taking into account the band-diagram of LT-GaAs is used for the theoretical analysis. The use of transform-limited pulses at the PC antenna is critical experimentally. Previously unnoticed THz pulse features and anomalously increasing THz radiation power rather than saturation were observed. These are in good agreement with the theoretical predictions. The interplay of intensity dependence and dynamics of generation of photoexcited carriers by single-photon absorption and TPA for THz emission is discussed.
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