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Title:Broadband terahertz spectroscopy

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Abstract:An overview of the major techniques to generate and detect THz radiation so far, especially the major approaches to generate and detect coherent ultra-short THz pulses using ultra-short pulsed laser, has been presented. And also, this paper, in particularly, focuses on broadband THz spectroscopy and addresses on a number of issues relevant to generation and detection of broadband pulsed THz radiation as well as broadband time-domain THz spectroscopy (THz-TDS) with the help of ultra-short pulsed laser. The time-domain waveforms of coherent ultra-short THz pulses from photoconductive antenna excited by femtosecond laser with different pulse durations and their corresponding Fourier-transformed spectra have been obtained via the numerical simulation of ultrafast dynamics between femtosecond laser pulse and photoconductive material. The origins of fringes modulated on the top of broadband amplitude spectrum, which is measured by electric-optic detector based on thin nonlinear crystal and extracted by fast Fourier transformation, have been analyzed and the major solutions to get rid of these fringes are discussed.

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