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Title:Waveform-Controlled Terahertz Radiation from the Air Filament Produced by Few-Cycle Laser Pulses
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Abstract:Waveform-controlled terahertz (THz) radiation is of great importance due to its potential application in THz sensing and coherent control of quantum systems. We demonstrated a novel scheme to generate waveform-controlled THz radiation from air plasma produced when carrier-envelope-phase (CEP) stabilized few-cycle laser pulses undergo filamentation in ambient air. We launched CEP-stabilized 10 fs-long (similar to 1.7 optical cycles) laser pulses at 1.8 mu m into air and found that the generated THz waveform can be controlled by varying the filament length and the CEP of driving laser pulses. Calculations using the photocurrent model and including the propagation effects well reproduce the experimental results, and the origins of various phase shifts in the filament are elucidated.
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