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Title:Distortion of terahertz signals due to imperfect synchronization with chirped probe pulses

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Abstract: Terahertz (THz) signals measured by means of the spectral-encoding technique with different temporal discrepancies between probe pulses and THz signals are investigated. It is found that imperfect synchronization between the chirped probe and THz pulses induce a distortion and this distortion affects significantly the retrieved THz spectrum if the temporal discrepancy is large. The distortion becomes more prominent if the probe pulse length is less than the optimal chirped probe pulse duration. A simple approach is proposed to realize the synchronization and minimize the distortion. THz signals from a high-voltage-biased air plasma filament are measured with this approach and distortion similar to the simulation results is observed.

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