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Divergence angle characterization of THz radiation from two-color laser filamentation in air[1] YUNGJUN YOO, DONGHOON KUK, ZHEQIANG ZHONG, KI-YONG KIM, Univ of Maryland-College Park — We have characterized the divergence angle of terahertz (THz) radiation produced via femtosecond two-color laser mixing in air. In this scheme, a femtosecond laser pulse is mixed with its second harmonic pulse to generate air plasma and simultaneous THz radiation in the far field. To measure the divergence angle, we have performed THz beam profiling at various positions along its propagation direction. In particular, we have investigated the dependence of beam focusing geometry (f-number) and THz radiation frequency. To test the f-number effect, we have varied the numerical aperture (NA) of incoming laser from 0.01 to 0.06 by using different focal length lenses. Also, to investigate the frequency dependence, we have used bandpass metallic THz filters in front of our pyroelectric or uncooled microbolometer (tau2, FLIR) detectors. We find that the THz radiation angle is greatly affected by the laser focusing geometry. For real-time THz imaging, lock-in detection is applied to the microbolometer camera, which yields an improved signal-to-noise ratio at our detection bandwidth (1˜30 THz).

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