

Abstract Submitted
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Refocusing and high field generation of terahertz radiation in two-color laser filamentation¹ YUNGGJUN YOO, DONGHOON KUK, KI-YONG KIM, Univ of Maryland-College Park — We have demonstrated strong terahertz (THz) field generation by using femtosecond two-color laser mixing in air. In this experiment, we have tested THz energy scaling and refocusing by varying the lens focal length from 200 mm to 1 m. We find that the output THz energy greatly enhances with increasing focal length (or plasma filament length), which is consistent with previous reports. In addition, contrary to our previous concern that long filamentation may yield more THz energy but unfavorably increase the focused spot size, both short and long filamentation provide small spot sizes (35~50 microns in FWHM). This implies that the peak field 8 MV/cm, previously achieved with a 200 mm focal length, can be greatly enhanced with long filamentation and tight refocusing. In addition, for real-time THz beam profiling, an uncooled microbolometer camera is used with lock-in detection, providing enhanced signal-to-noise ratios at a broad range of THz (1~40 THz) frequencies.

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Ki-Yong Kim
Univ of Maryland-College Park

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