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THz generation from elliptically-focused two-color laser pulses at 1 kHz[1] YUNGJUN YOO, DONGHOON KUK, ZHEQIANG ZHONG, KI-YONG KIM, Univ of Maryland-College Park — We have generated high-power terahertz (THz) radiation by elliptical focusing of two-color femtosecond laser pulses in air at a 1-kHz repetition rate. Elliptical focusing produces a 2-dimensional plasma sheet, emitting two diverging THz radiation lobes in the far field. Such radiation is collimated and refocused by a combination of cylindrical and off-axis parabolic mirrors. Here the distances between the 2-D plasma sheet, cylindrical mirror, and off-axis parabolic mirror are carefully adjusted to minimize the THz spot size at the refocus. The refocused THz field strength is estimated by measuring the THz energy, beam spot size, and waveform. Here an uncooled microbolometer camera with real-time lock-in imaging is used to monitor and measure the focused THz beam profiles with a high signal-to-noise ratio at a broad range of THz (1˜40 THz) frequencies. High-pressure gas (N2 and Ar) jets puffed in air are also tested as laser targets to boost the output THz energy even further.

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