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Title:Remote generation of high-energy terahertz pulses from two-color femtosecond laser filamentation in air

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Abstract: We experimentally investigated the dynamic behavior of remote terahertz (THz) generation from two-color femtosecond laser-induced filamentation in air. A record-high THz pulse energy of 570 nJ at frequency below 5.5 THz was measured by optimizing the pump parameters at a controllable remote distance of 16 m, while super-broadband THz (<300 THz) pulse energy was up to 2.8 μJ. A further energy-scaling possibility was proposed. By analyzing simultaneously the fluorescence from both neutral N2 and N2+ in the filament, we found that the enhancement of THz radiation was due principally to guiding of the weak second-harmonic pulse inside the filament of the first strong fundamental pulse.

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