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Effects of picosecond terawatt UV laser beam filamentation and a repetitive pulse train on creation of prolonged plasma channels in atmospheric air

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The multiple filamentation over very long propagation distances ~ 100 m was measured for peak pulse power exceeding the critical value for λ=248-nm radiation (~108 W) in 2000 times. An all-reflection mirror focusing scheme with a small numerical aperture of about 3 10-4 was designed. The intensity distribution was recorded by using glass plate fluorescence under UV irradiation with imaging at the time-gated CCD. It was found that the filamentation of high-power UV laser beam is quite different of longer wavelengths.

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