Scaling power, bandwidth, and efficiency of mid-infrared supercontinuum source based on a GeO2-doped silica fiber

We demonstrate a supercontinuum source with a 20 dB bandwidth from ∼1 to ∼3 μm with output power exceeding 6 W based on a GeO2-doped silica fiber. This is the highest output power reported for a 3 μm supercontinuum source based on germania-doped silica fiber in an all-fiberized and compact size device. We further demonstrate a spectrum spanning from ∼1.7 to ∼3.4 μm (∼10 dB bandwidth from ∼1.8 to ∼3.2 μm) at a low power of tens of milliwatts with more than 50% power fraction above 2400 nm, which makes this source suitable for several applications where a broadband source at low power is required to avoid damage of the samples. Our investigations reveal the unexploited potential of germania-doped fiber for mid-infrared supercontinuum generation and surpass the current state-of-the-art results.

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