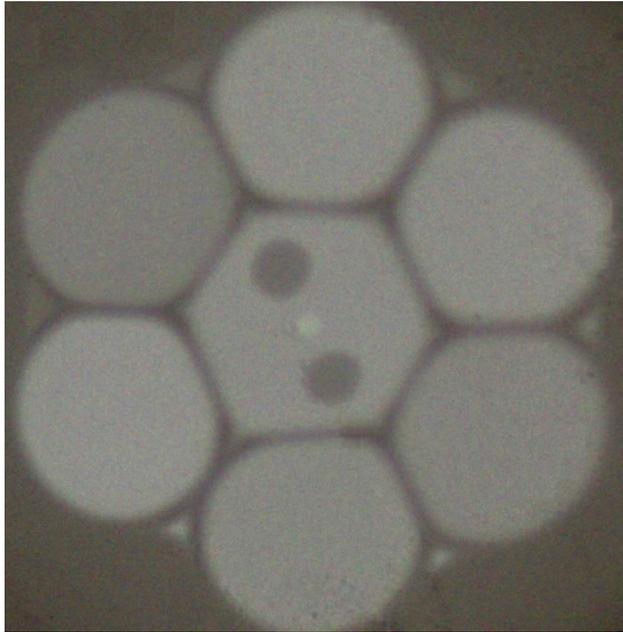


Fiber laser components

Another focus of high-power fiber laser technology at IOSB addresses specific fiber laser components like fiber endcaps, fiber cladding-mode strippers, signal pump combiners, tapers, etc., that allow for integrating specific functions or increased damage thresholds for power-scaled lasers.



Cross section of a 2 μm PM-fiber pump combiner.

Research for partners and customers

We perform laser damage testing on fibers and (fiber) optical components in the context of our own laser research and in common research projects, where these capabilities are made available to our partners and customers in research and development of optical components and coatings.

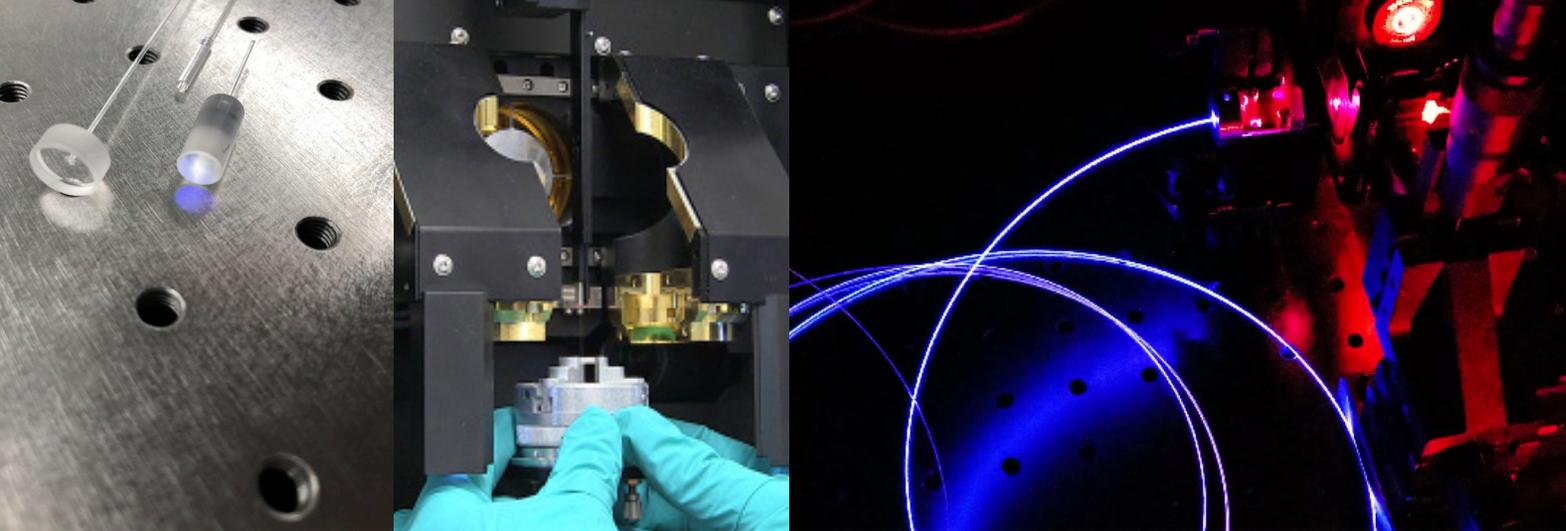
Contact

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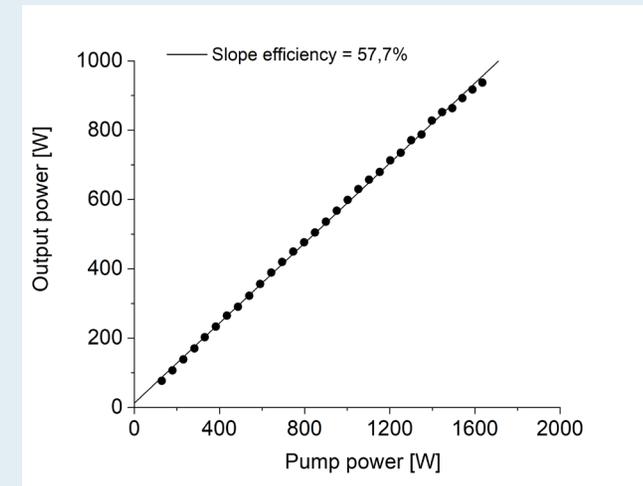
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Thulium-doped fiber laser operating in the 2 μm wavelength range.



Output power of a thulium fiber amplifier..

High-power fiber laser sources in the short-wave to long-wave infrared spectral range

Future high-power fiber laser sources need optimized all-fiber components with security of supply

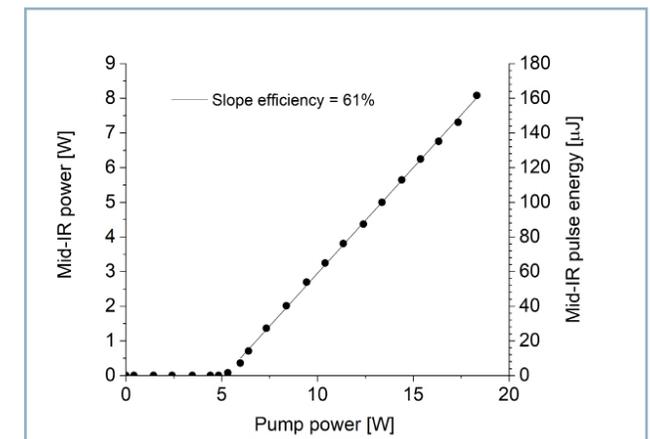
Fraunhofer IOSB is performing research and development on novel architectures of fiber lasers and amplifiers and specifically develops new tailored fiber components for high-power SWIR to MWIR fiber lasers.

Such fiber lasers can be used in a wide spectrum of industrial and defense applications, ranging from material processing in industry and medicine, molecular spectroscopy and remote sensing, LIDAR, free-space optical communication, and optronic countermeasures to high-energy lasers. Besides their direct use, they can also be employed as pump sources for non-linear interactions in crystals and fibers to generate new wavelengths ranging from mid- to long-wave infrared up to 12 μm, e.g. in supercontinuum sources or optical parametric oscillators (OPO).

Fiber laser sources

Besides fundamental and applied research on active fibers and fiber lasers a focus on the development of high-power fiber laser technology at IOSB addresses ruggedized low SWaP all-fiber designs. This includes all-fiber laser sources based on active fibers doped with rare-earth ions (Er³⁺, Tm³⁺, Ho³⁺) in continuous and pulsed operation modes.

High-power narrow-linewidth cw sources beyond 330 W and pulsed fiber amplifiers with more than 11 kW of pulse peak power in the 2 μm range and subsequent non-linear conversion with over 8 W of average power in the MWIR are typical examples. Specific pump laser designs assure high non-linear conversion efficiencies.



Output power of a 2 μm fiber-laser-pumped OPO.