

Hollow-core fibers for high power pulse delivery - DTU Orbit (08/11/2017)

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We investigate hollow-core fibers for fiber delivery of high power ultrashort laser pulses. We use numerical techniques to design an anti-resonant hollow-core fiber having one layer of non-touching tubes to determine which structures offer the best optical properties for the delivery of high power picosecond pulses. A novel fiber with 7 tubes and a core of 30 μm was fabricated and it is here described and characterized, showing remarkable low loss, low bend loss, and good mode quality. Its optical properties are compared to both a 10 μm and a 18 μm core diameter photonic band gap hollow-core fiber. The three fibers are characterized experimentally for the delivery of 22 picosecond pulses at 1032nm. We demonstrate flexible, diffraction limited beam delivery with output average powers in excess of 70W. (C) 2016 Optical Society of America

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