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## Narrow core standard single mode fiber for supercontinuum generation from graphene-based mode -locked pulses (Article)

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### Abstract

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In this work, a supercontinuum (SC) source is proposed and demonstrated using a highly-doped, 2 m long zirconia-erbium doped fiber (Zr-EDF) with a dopant concentration of 3800 ppm/wt and a narrow core 100 m long single-mode-fiber (SMF). A graphene based saturable absorber (SA) is used as a passive mode-locker, generating pulses with an average output power, pulse energy and peak power of ~0.9 mW, ~69.8 pJ and ~83 W respectively and a repetition rate of 12.9 MHz. This is then amplified using a 140 mW amplifier, giving an output power, pulse energy and peak power of ~75.0 mW, 5.8 nJ and ~6.76 kW respectively and injected into a 100 m long SMF, to generate an SC output which spans from 1450 to more than 1700 nm, with a pulse width at its full-width-at-half-maximum (FWHM) of 120 fs, 7 times lower than the 840 fs FWHM width of the pulses from the fiber laser. The narrow core SMF performs comparably to longer lengths of standard SMF-28 fibers. © 2018 Elsevier GmbH

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Engineering uncontrolled terms

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