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Investigating the optical properties of ANDi-PCFs for nonlinear imaging application

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Abstract content
   (Max 300 words)
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Passive highly nonlinear Photonic Crystal Fibers (PCFs) can be pumped with short pulses to produce a supercontinuum of power distributed over a wide bandwidth. These PCFs are currently being considered for use in many applications including sensors, high power-pulse transmission and medical uses due to their varying advantages such low light loss. The Laser Research Institute (LRI) has recently developed new types of 'All Normal Dispersion' Photonic Crystal Fibers (ANDi-PCF) capable of spectrally broadening the femtosecond laser pulse into a supercontinuum (SC) which is smooth, stable and compressible for spectroscopic and biophotonics applications. Due to the nonlinear features inherent in the fibers, this research focused on the characterization of different ANDi-PCFs to investigate the optimal transmission and supercontinuum generation features of each fiber. The dependence of the output polarization on the input power and input polarization angle was also determined together with the spectral dependence on the input power and input polarization and angles. An in-house commercial femtosecond laser was used as a light source to deliver ultrashort laser pulses (10-13–10-14 seconds), capable of inducing nonlinear optical effects, to the PCF. The femtosecond laser source was optically coupled into the ANDi-PCF to generate a broadband SC source for analyses.

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PhD

Main supervisor (name and email)
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