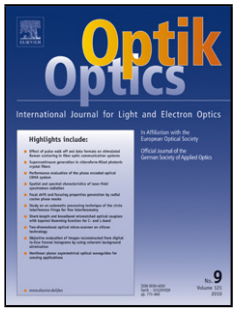

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Analysis of Zero Dispersion Shift and Supercontinuum Generation at Near IR in Circular Photonic Crystal Fibers.

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Abstract

In this paper, we engineered a Circular PCF having a very low confinement loss and high nonlinear coefficient, from five Circular PCFs of same ring separation value. From the analysis, it is derived that the zero dispersion wavelengths can be shifted by increasing the d/R ratio. Analysis of light propagation fiber characteristics such as confinement loss, effective mode area, non linear coefficient, numerical aperture and chromatic dispersion of silica core circular photonic crystal fibers have been investigated by full vector finite element method. Simulation results show that, the magnitude of confinement loss can be reduced to a value of 5.5012×10^{-6} dB/km at the operating wavelength 1550nm for the structure with d/R = 0.8 and the corresponding effective mode area is $3.78046\mu m^2$ and nonlinear coefficient is $0.03313 km^{-1}W^{-1}$. C-PCFs with small air hole diameter show flat chromatic dispersion response over the wavelength region 1400nm to 1800nm. In addition to tight light confinement and Gaussian output over the entire operating wavelengths, we have simulated the Super continuum generation in the d/R =0.8 fiber for different coupled power.

Keywords: Circular photonic crystal fiber (C-PCF), Confinement loss, Effective mode area, Nonlinear coefficient, Numerical aperture, Chromatic dispersion.

1. Introduction