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Low Nonlinear Effects Index-Guiding Nanostructured Photonic Crystal Fiber

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Abstract : Photonic Crystal Fibers (PCFs) can be used in optical communications as transmission lines. For this reason, the PCFs with low confinement loss, low chromatic dispersion, and low nonlinear effects are highly suitable transmission media. In this paper, we introduce a new design of index-guiding nanostructured photonic crystal fiber (IG-NPCF) with ultra-low chromatic dispersion, low nonlinearity effects, and low confinement loss. Relatively low dispersion is achieved in the wavelength range of 1200 to 1600nm using the proposed design. According to the new structure of nanostructured PCF presented in this study, the chromatic dispersion slope is -30(ps/km.nm) and the confinement loss reaches below 10-7 dB/km. While in the wavelength range mentioned above at the same time an effective area of more than 50.2μm2 is obtained.

Keywords : optical communication systems, nanostructured, index-guiding, dispersion, confinement loss, photonic crystal fiber
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