Design of a New Honeycomb PCF for Ultraflatten Dispersion over Wideband Communication System

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Abstract

A new kind of honeycomb photonic crystal fiber structure with triangular lattice is proposed. For the proposed design three different air-hole diameters in cladding region is used. To calculate dispersion, 2-D finite difference frequency domain method with the Transparent Boundary conditions (TBC) absorbing boundary conditions is used. Through the numerical simulation and optimizing the geometrical parameters like changing the diameter of air holes (d) for photonic crystal fibers in triangular lattice structure, it has been demonstrated that it is possible to obtain ultra flatten dispersion over a wide wavelength range which lies in second and third telecom window. The ultra flatten dispersion 0±0.13 is obtained in the wavelength range 1.4 to 1.71μm. The proposed structure is designed using seven ring in which circular air holes are used. The best choice of material for the designing purpose is silica with refractive index 1.458.

References

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Index Terms

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Keywords

Effective Refractive Index (neff), Photonic Crystal Fiber (PCF), Transparent Boundary Condition (TBC).