PROPERTIES OF PHOTONIC CRYSTAL FIBERS WITH CORE FILLED CARBON DISULFIDE

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Abstract:

A photonic crystal fiber (PCF) with hollow core filled with carbon disulfide (CS_2) is considered as a new soure of supercontinuum light. Guiding properties in terms of effective refractive index, effective mode area, and dispersion of the fundamental mode are studied numerically. In our model, a PCF consists of eight rings of air-holes ordered in a hexagonal lattice, surrounding the core filled with CS_2. The numerical simulations were conducted for the lattice constants equal to 3.0 μm, 4.0 μm, 5.0 μm, and 6.0 μm, and for the linear filling factors 0.4, 0.6, and 0.8. The results showed that the dispersion characteristic shifts toward lower values and flatten dispersion for longer waves. Furthermore, it is possible to shift the zero-dispersion wavelength and modify fundamental properties of photonic crystal fibers by change in diameter of core. These results are very important because of that we not only use their reasonable parameters for the design and manufacture but also use them in nonlinear phenomena and nonlinear applications of fibers.

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