

Simulation and comparison of the mode structure in silver halide hollow- and solid-core PCFs with a single ring of elements for the MIR

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Abstract

We simulated the mode structure of photonic crystal fibers with a single ring of elements hexagonally and octagonally arranged around either a solid core or a central defect with either lower or higher optical density, counting upon the refractive indices of $\text{AgCl}_{1-x}\text{Br}_x$ system, where $x = 0.75, 0.82, \text{ and } 0.84$. Mode comparison revealed the advantages of the active-core fiber, i.e. with a higher refractive index of the central rod element. We also predicted such a fiber to be capable of guiding more optical power, comparing with a standard double-layered one with similar dimensions.