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LIST OF ABSTRACTS

Recent Progress in the Analysis and Simulation of Zeonex Based Photonic Crystal Fibers for Terahertz Wave Guiding

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Abstract

Photonic Crystal Fibers (PCFs) represent an innovative class of optical fibers, also referred to as holey fiber, or microstructured fiber, derives its waveguiding characteristics not from a variable glass composition but from a precise arrangement of minute and densely positioned air holes that traverse the entire length of the fiber. These fibers offer unique advantages in guiding THz waves, such as low loss, high confinement, and flexible dispersion engineering. Over the entire class of PCFs, Zeonex based photonic crystal fibers have proved themselves the most suitable candidates for terahertz (THz) waveguiding applications. This paper is intended to present a comprehensive overview of the most recent developments in the field, focusing on key aspects such as the design and optimization of Zeonex PCF structures, numerical modeling techniques, and experimental validation methods. It also reviews the basic guiding principles encompassing the optical properties such as effective material loss, confinement loss, bending loss, core power fraction, dispersion variation, and birefringence.

Keywords: *Photonic crystal fibre, Terahertz waveguiding, Zeonex, High confinement*

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