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Paper: Experimental characterization of spectral effective index dependence of the index-guided photonic crystal fibers

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Abstracts:

The effective index of index-guided photonic crystal fibers (IG-PCF) is experimentally obtained as a function of the wavelength by writing fiber Bragg gratings (FBG) in the fibers. The results are found to be in good agreement with theoretical simulations and are also discussed and compared with measurements on standard telecommunication fibers. Differences between the fibers were observed both in the Bragg grating inscription process and in the fiber effective index value evolution with the wavelength, which depends on the fiber cladding microstructure. Index evolution slopes of $-2.029 \times 10^{-5} \text{ nm}^{-1}$, $-2.044 \times 10^{-5} \text{ nm}^{-1}$ and $-1.388 \times 10^{-5} \text{ nm}^{-1}$ were measured for the two IG-PCFs and the standard fiber, respectively.