



## Field analysis of TE and TM modes in photonic crystal Bragg fibers by transmission matrix method

M Hosseini Farzad<sup>1</sup> and N Yazdanpanah<sup>2</sup>

1. Department of Physics, Shiraz University, 71454
2. Department of Physics, Payam-Noor University of Shiraz

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### Abstract

In this article, we considered the field analysis in photonic crystal Bragg fibers. We apply the method of transmission matrix to calculate the dispersion curves, the longitudinal wave number over wave number versus incident wavelength, and the field distributions of TE and TM modes in the Bragg fiber. Our analysis shows that the field of guided modes is confined in the core and can exist only in particular wavelength bands corresponding to the band-gap of the periodic structure of the clad. From another point of view, light confinement is due to Bragg reflection from high- and low-refractive index layers of the clad. Also, the diagram of average angular frequency with respect to average longitudinal wave number is plotted so that the band gap regions of the clad are clearly observed.

**Keywords:** photonic band-gap fibers, photonic crystal Bragg fibers

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