

Switching Behaviour in an Equi-dimensional Core-Cladding Photonic Crystal Fiber using FDTD Technique

A PANDA¹, M HOTA¹, S K TRIPATHY²

¹Department of Physics, National Institute of Science and Technology, Palur Hills, Brahmapur, Odisha, India, 761008.

²Department of Physics, Berhampur University, Berhampur, Odisha, India, 760007
hotamihir@yahoo.co.in, sukantakutripathy@yahoo.co.in

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Abstract. The investigation in this paper shows the switching of transmission intensity in a hollow-core photonic crystal fiber where the radius of the core and the cladding are kept equal. The basic operation relies upon the principle of interference of two optical signals. For the realization of the phenomenon of the interference various combinations of the phase differences are introduced between the two applied signals. At a particular phase difference the resultant output signal is found to be switched from maximum to minimum intensity and vice-versa with the inversion in the phase difference. Again, it is also observed that, the third order nonlinearity plays a vital role in the shaping up of the transmission signal. The structures are designed and simulated using the Finite Difference Time Domain (FDTD) tools.

Keywords. finite difference time domain method; photonic switching; photonic band gap; photonic crystal fiber; third order nonlinearity.

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