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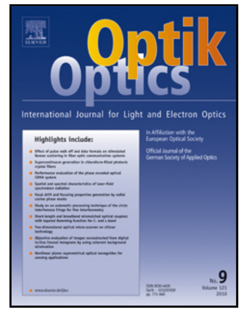

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FDTD approach to photonic based angular waveguide for wide range of sensing application

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Abstract
Photonic based angular waveguide is employed in this communication to envisage a wide range of sensing application with the help of finite difference time domain approach, whereproposed photonic structure is realised by 11×11 airholes with elimination of series of holes pertaining to L type bending channel, which would be deployed for solving bending loss issues in photonic integrated circuits. However present research is manipulated with visible, infrared signal which acts as input to focus on evanescent signal to comprehend wide range of sensing application, whose ranges from infrared to ultra violet through visible, where the principle of signal is based on the variation of electric field distribution in the said waveguide.

Keywords: FDTD, evanescent waves,defective waveguide

1. Introduction

After invention of Photonic crystal by Y. Yoblovitch and S.Jhon in the year 1988 [1,2], researchers have thoroughly studied several waveguide structuresfor various application vis-à-vis sensing networking and communication.Thoughdefectless photonic crystal waveguide has been bestowing a new type of application, nevertheless defect waveguide exhibits peculiar properties related to nonlinear behaviour for accomplishing extra ordinary characteristics. We in this paper, consider asimilar type of photonic crystal waveguide, where series of air holes have been removed to study the evanescent wave signal for realising sensing application. Before going to discuss the internal mechanism of waveguide structure, let us focus on brief description on literature survey different waves related to proposed works presenting in this report. For example; reference [3] discusses the optimization of photonic crystal waveguide for demultiplexer application, where sensing application is made in reference [4] and [5] using two and one dimensional waveguides respectively. Though the above said references disclose different applications, they deal with plane wave expansion computation which may be lagging with respect to accuracy as compared to finite difference time domain technique. Further in reference [6], author demonstrated atuneable photonic crystal fiber