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Realization of all logic gates using hybrid grating structure: An application of silicon photonics

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Abstract

The outcome of present research work divulges all type of logic gates (NOT, AND, OR, XOR, NAND, NOR, XNOR) using two simple silicon grating structures, where plane wave expansion method manipulates to such structure to investigate the transmission characteristics. Output results infers that grating parameter such as number of layers, thickness of odd and even layer, the length of grating odd the proposed structure plays vital role to realize different type of optical logic gates.

Keywords- Logic gates, hybrid photonic structure, Transmittance

1. Introduction

Silicon photonics is a promising area in the field of optical technology owing to its superior properties. The factual research in the field of photonics began in the late 1980s and has been burgeoning ever since [1]. As far as definition of silicon photonics is concerned, it is the study and application of photonics system, which use silicon as optical medium. Silicon photonics are also great academics interest due to their ability to support exotic nonlinear optical phenomena. As far as literature survey is concerned many works related to silicon photonics are found in the literature such as optical interconnects , optical router , signal processing, long range telecommunication and light

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