Design and simulation of all optical optimized photonic crystal logic gate using ring resonator

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Abstract Title: Design and simulation of all optical optimized photonic crystal logic gate using ring resonator In this thesis an all-optical photonic crystal NOR logic gate based on ring resonator is presented. A two dimensional 2030 square array with the constant of the lattice of 0.605 µm and the radius of 0.12 µm is used in designing this gate for working at the wavelength of 1550 nm. In order to standardize, logic levels are presented based on the input power P0 firstly. The output power of NOR gate at single-input and two-input state is 0. The output is 1 only when the inputs are 0. The power at single-input state and two-input state has obtained 0.9 P0 and 1.8 P0 respectively. The performance speed is 1.67 Tb/s. Usage of two logical switches is one of the properties of this structure which a ring resonator is used for each one of them. The designed gate is capable of being used in integrated optical circuits.

Keywords : Keywords: photonic crystal logic gate, photonic crystal structures, photonic crystal gate with ring resonator