

Title: Robust and tunable integrated polarization rotator

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Abstract:

Integrated polarization rotators suffer from very high sensitivity to fabrication errors. A polarization rotator scheme that substantially increases fabrication tolerances is proposed. In the proposed scheme, two tunable polarization phase shifters are used to connect three rotator waveguide sections. By means of properly setting the polarization phase shifters, fabrication errors are compensated and perfect polarization rotation is achieved. Analytical conditions are shown that determine the maximum deviation that can be corrected with the proposed scheme. A design example is discussed, where the thermo-optic effect is used to provide the required tunable polarization phase shifting. Calculated 40dB extinction ratio is shown in presence of fabrication errors that would yield a 4dB extinction ratio in the conventional approach.

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