

Title: Robust and tunable integrated polarization rotator

Name/Surname of all authors:

Carlos Alonso-Ramos¹, Robert Halir¹, Alejandro Ortega-Moñux¹,
Pavel Cheben², Laurent Vivien³, Íñigo Molina-Fernández¹, Delphine
Marris-Morini³, Siegfried Janz², Dan-Xia Xu², Jens Schmid²

Affiliation:

1 Dpto. Ingeniería de Comunicaciones, ETSI Telecomunicación,
Universidad de Málaga, 29010 Málaga, Spain

2 National Research Council of Canada, Ottawa, K1A 0R6, Canada

3 Institut d'Electronique Fondamentale, Univ. Paris-Sud—CNRS
UMR8622, Bat. 220, F-91405 ORSAY, France

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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