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Polarization beam splitter based on liquid-filled dual-core photonic crystal fiber with gold wire

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Abstract: A polarization beam splitter (PBS) based on a novel liquid-filled dual-core photonic crystal fiber (DC-PCF) is proposed. The effects of parameters of DC-PCF on performances of the PBS are investigated by beam propagation method (BPM). The numerical results demonstrate that the PBS possesses ultra-short length of 99 μ m and high extinction ratio (ER) of -33.8 dB at the wavelength of 1.55 μ m. Meanwhile, an ER better than -10 dB is achieved a bandwidth of 32 nm.

Keywords: photonic crystal fiber; polarization beam splitter; coupling length ratio; extinction ration

1 Introduction

Silicon waveguides based on the silicon-on-insulator (SOI) structure have attracted a lot of attention due to their enhanced nonlinearity, compatibility with commercial complementary metal-oxide-semiconductor process, and mode confinement [1]. Therefore, high-density integration of optical components and mass production can be realized [2]. However, polarization control in SOI structure remains a major issue [3]. Because the birefringence is significant for the silicon waveguide and the SOI-based devices are usually polarization dependent [4]. Therefore, polarization handling devices, such as polarization rotators (PR) [5, 6] Download English Version:

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