34

New optical circuit design based on wavefront matching method

- Calculation algorithm for optimum circuit design -

Motivation

Silica-glass planar lightwave circuit (PLC) devices exhibit high performance and are widely used in optical communication systems owing to their adaptability for high integration and good optical characteristics. To improve their performance much further, we provide for research in the field of optical circuit design.

Originality

For conventional circuit design, the designer lay out basic circuit elements such as straight and bent waveguides based on their flair and experiences to obtain desired functions. On the other hand, our proposed wavefront matching (WFM) method enables us to synthesize optimum optical circuits deterministically from desired characteristics.

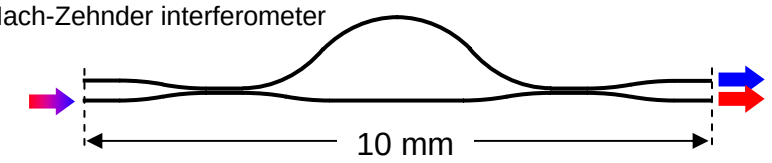
Impact

The design based on the WFM method have the potential to overcome the performance limitation of conventional PLC devices and improve their performance much further. In addition, we expect that the WFM method provide us an optical circuit device with novel functions.

Contact person: Yohei Sakamaki
Photonics Integration Laboratory, NTT Photonics Laboratories
TEL: 046-240-4093 FAX: 046-240-4528
e-mail: sakamaki@aecl.ntt.co.jp

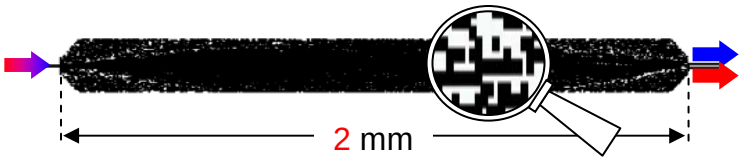
Conventional wavelength demultiplexer

Mach-Zehnder interferometer



New wavelength demultiplexer designed by WFM method

Composed of distributed micro-dots instead of lines



Simulation results using beam propagation method