Opto-Electronics Review, 2015, volume 23, issue 4, pp. 271-277

Design and performance analysis of InP/InGaAsP-MMI based 1310/1550-nm wavelength division demultiplexer with tapered waveguide geometry

Chack, D.; Kumar, V.; Raghuwanshi, S. K.

DOI: https://doi.org/10.1515/oere-2015-0039

Abstract:

The design and performance analysis of a 1310/1550-nm wavelength division demultiplexer with tapered geometry based on InP/InGaAsP multimode interference (MMI) coupler has been carried out. Wavelength response of demultiplexer of conventional MMI and tapered input and tapered output (tapered I/O) waveguides geometry of the MMI have been discussed. The demultiplexing function has been first performed by choosing a suitable refractive index of the guiding region and geometrical parameters such as the width and length of MMI structure have been achieved. Access width of tapered I/O waveguides have been adjusted to give a low insertion loss (IL) and high extinction ratio (ER) for the considered wavelengths of 1310 nm and 1550 nm. The total size of the demultiplexer has been significantly reduced over the existing MMI devices. Numerical simulations with finite difference beam propagation method are applied to design and optimize the operation of the proposed demultiplexer.