Abstracts

GaAs/GaAlAs Curved Rib Waveguides

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Curved dielectric optical waveguides suffer from radiation loss due to bending. To minimize the bending loss and reduce the radius of curvature, it is necessary to fabricate guides which provide strong optical confinement. This paper gives a brief review of curved waveguide analysis and presents some experimentally measured loss values for GaAs/GaAlAs curved rib waveguides. The rib waveguides, fabricated using ion beam milling, have a large rib height and are tightly guided structures. When corrected for reflection losses and input coupling efficiency, a minimum loss of approximately 3 dB has been achieved for a multimode 90° curved guide with a radius of curvature of 300 µm, and 8.5 dB for a single-mode curved guide with a radius of curvature of 400 µm. It is believed that most of this residual loss is not radiation loss due to bending, but rather scattering loss due to rib wall imperfections.

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