Abstracts

Analysis of Optical Waveguide Consisting of a Square-Law Lenslike Medium and its Analogies to Circular TE/sub 01/ waveguide

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Propagation behavior of light beams along sinusoidal and serpentine bends as well as circular bends and linearly tapered bends of optical waveguides consisting of a square-law Ienslike medium is investigated in detail, both theoretically and numerically, on the basis of the approximate wave theory. A new design method of the circular bend for removing the effects of the bend is proposed and numerical results are presented. The divergence phenomena of the beam trajectory in both the sinusoidal and serpentine bends of the optical waveguide are discussed in comparison with mode-conversion phenomena occurring in the circular TE/sub 01/ waveguide with the same bends. Several design conditions to eliminate undulations of the beam trajectory and/or the spot size which would occur at a circnlar bend of the optical waveguide are also studied, and interesting analogies to the design conditions proposed so far to prevent mode-conversion losses at a circular bend of the TE/sub 01/ waveguide are shown.

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