
POWER CHARACTERISTICS OF DIELECTRIC OPTICAL PIET HEIN WAVEGUIDES

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Received 16 April 2002

ABSTRACT: *A fairly rigorous analytical treatment of the power characteristics of dielectric optical waveguides with Piet Hein core-cross sectional geometry is presented in this paper. This kind of waveguide structure would be advantageous owing to the absence of corners, which are found in rectangular guides, resulting in undesirable loss due to the scattering of light. In order to simplify this theoretical approach, an approximation of vanishing refractive index difference between the guiding and the non-guiding sections is implemented. The variation of logarithmic power is shown for different dimensions of the core, corresponding to different azimuthal modal indices. It is found that the modes with higher index values carry less logarithmic power in the lower tail of the propagation's constant range, and this feature affects the higher tail. A better kind of uniformity of the power distribution is observed near the higher tail of the range of propagation constants. This feature*