Abstracts

Tolerance Requirements for Dispersion Free Single-Mode Fiber Design: Influence of Geometrical Parameters, Dopant Diffusion, and Axial Dip

P.-L. Francois. "Tolerance Requirements for Dispersion Free Single-Mode Fiber Design: Influence of Geometrical Parameters, Dopant Diffusion, and Axial Dip." 1982 Transactions on Microwave Theory and Techniques 30.10 (Oct. 1982 [T-MTT] (Special Issue on Optical Guided Wave Technology)): 1478-1487.

The dispersion sensitivity to small changes in index-differences, radius, and wavelength is investigated in the case of dispersion free single-mode fibers. If a minimum bandwidth is required, tolerances on the various parameters can then be deduced: singly- and doubly-clad structures are compared. Constant reference is made to the HE/sub 11/ mode spot-size to relate dispersion properties and attenuation. A nonzero fundamental mode cutoff is shown to induce an enhanced sensitivity to a change in fiber geometrical characteristics. The effect of dopant diffusion and axial dip on dispersion is then considered and conclusions are drawn concerning the use of profiles measured on preforms to predict fiber propagation properties.

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