Abstracts

Single-Mode Fiber Design for Long Haul Transmission

L. Jeunhomme. "Single-Mode Fiber Design for Long Haul Transmission." 1982 Transactions on Microwave Theory and Techniques 30.4 (Apr. 1982 [T-MTT] (Joint Special Issue on Optical Guided Wave Technology)): 573-578.

By using simple yet accurate approximations for the propagation characteristics of a single-mode optical fiber, we obtain a simple model for the total loss and chromatic dispersion of single-mode fiber transmission lines as a function of the operating conditions such as splice offset, microbending loss, bends, etc. This model is then applied to typical cases of terrestrial and submarine systems and we obtain single-mode fiber designs which are stable with respect to slight operating condition changes for both 1.3 and 1.55 µm wavelengths. It appears that the same fiber can be used at 1.3 µm for both terrestrial and submarine systems, and even for 1.55 µm terrestrial systems if monochromatic sources become available at this wavelength. A general comparison between the two wavelengths is carried out and shows under which conditions the 1.55 µm wavelength is of practical interest. It is emphasized that the availability of monochromatic sources at 1.55 µm would make a major breakthrough for the repeater spacing.

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