Abstracts

Polarization Holding in Ellipitical-Core Birefringent Fibers

S.C. Rashleigh and M.J. Marrone. "Polarization Holding in Ellipitical-Core Birefringent Fibers." 1982 Transactions on Microwave Theory and Techniques 30.10 (Oct. 1982 [T-MTT] (Special Issue on Optical Guided Wave Technology)): 1503-1511.

Polarization holding in high-birefringence elliptical-core fibers is evaluated for the fiber birefringence spatial frequency range 1.5 cm/sup -1/ < Beta/sub i/ < 40 cm/sup -1/, corresponding to beat lengths from 1.6 mm to 4.2 cm. This range of spatial frequencies is spanned by making measurements with a broad-band light source on four fibers with different degrees of birefringence. In this way, the strength of the internal birefringence perturbations is mapped to give the first experimental measure of their power spectrum. It is shown that commonly available fiber jackets can significantly degrade the polarization holding. For low spatial frequencies, the strength of the perturbations decreases rapidly with increasing frequency, but this rate decreases by more than half over a one-and-a-half order of magnitude increase in spatial frequency. A possible origin of the perturbations is suggested and it is shown that the strength of these perturbations must be reduced if polarization holding to a very high degree is to be realized in elliptical-core fibers. Presently, internal perturbations limit the polarization holding to <= 14.4 dB over 1 km.

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