

Influence of wavelength on equilibrium mode distribution and steady state distribution in W-type plastic optical fibers

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Abstract

Wavelength dependence of equilibrium mode distribution (EMD) and steady state distribution (SSD) in W-type plastic optical fibers (POFs) is investigated in this paper for parametrically varied width of the fiber's intermediate optical layer and refractive index of the outer cladding. We have shown that with increasing the wavelength EMD and SSD are achieved at shorter W-type POF lengths. This is explained by the rise of the leaky mode losses with increasing wavelength. This facilitates tailoring W-fibers to a specific application at hand at different wavelengths.

Keywords: W-fiber, plastic optical fiber, equilibrium mode distribution, steady state distribution, power flow equation