Abstracts

Optical Fibers with Coupled Dispersive Modes

R. Steinberg. "Optical Fibers with Coupled Dispersive Modes." 1975 Transactions on Microwave Theory and Techniques 23.9 (Sep. 1975 [T-MTT]): 721-724.

Marcuse's coupled-power theory incorporates the effect of different modal group velocities as the only mechanism responsible for pulse broadening in multimode, imperfect, optical fibers. In this paper the earlier theory is generalized to include the bandwidth-dependent effects: material dispersion and the waveguide dispersion that occurs within each mode. It is predicted that the latter two effects may partially cancel one another, the degree of cancellation depending on the shape of the fiber's refractive-index profile. Whether this effect causes a significant reduction in the calculated pulsewidth is shown to depend on the amount of mode coupling.

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