Abstracts

Suppression of Mode Partition Noise by Laser Diode Light Injection

K. Iwashita and K. Nakagawa. "Suppression of Mode Partition Noise by Laser Diode Light Injection." 1982 Transactions on Microwave Theory and Techniques 30.10 (Oct. 1982 [T-MTT] (Special Issue on Optical Guided Wave Technology)): 1657-1662.

This paper describes the improvement in mode partition noise characteristics when a laser light is injected into a laser diode modulated at 400 Mbits/s. A single-mode fiber transmission experiment is carried out for the 1.5 µm region. A 20 km repeater spacing at 400 Mbit/s modulation is achieved by LD light injection. The center longitudinal mode power is increased to 94 percent of the total modes. Relative noise in the center longitudinal mode is improved 30 dB by optical injection of -18.2 dBm. However, the mode partition noise generated by noninjected modes is not completely suppressed. The relationship between the half-power width of the spectral envelope and signal-to-noise ratio (SNR) degradation is obtained at 20 km fiber length. If 3 dB excess SNR degradation is allowed for the mode partition noise, then the necessary half-power width of the spectral envelope is less than 0.6 nm.

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