

Abstract

This paper is to analyze the impact of optical signal degradation on the quality of optical fiber communication systems, and enhance the way of reducing the signal degradation mechanism. In this paper, different investigation has been carried out in order to: Investigate the stability of various modulation formats to the effects of chromatic, polarization mode dispersion and nonlinear effects. And achieve the desired interest in the optical communications from the viewpoint of improving the stability to the dispersion, and find the optimum receiver bandwidth at which the system error rate is minimized. And find new ways of compensating chromatic dispersion in communication systems at 40 Gb/s. And find new ways to increase the range of transmission in a communication system transmitters based on semiconductor lasers with direct modulation.