

Abstract

Moustafa Hussein Aly

Design and Performance Evaluation of a Dispersion Compensation Unit Using Several Chirping Functions in a tanh Apodized FBG and Comparison with Dispersion Compensation Fiber

In this work, different methods for dispersion compensation are designed and evaluated, seeking a cost effective technique with remarkable dispersion compensation percentage and pulse shape. Different chirp functions applied to a Gaussian Fiber Bragg grating (FBG), Dispersion Compensation Fiber (DCF) and DCF merged with optimized linear chirp Gaussian FBG (joint technique) are the dispersion compensation techniques that are evaluated using standard 10 Gb/s optical link over 100 km long haul. Evaluation of different chirp functions resulted in the linear chirp function is the most appropriate one with a broadening reduction of 76.76%, lower price and poor pulse shape. DCF only and DCF merged with optimized linear chirp Gaussian FBG enhances the dispersion compensation performance to 92.67% and 96% respectively with fair pulse shape and higher cost. The joint technique used is more cost efficient than DCF only but still much expensive than Chirped Gaussian FBG.