

Effect of channel wavelength spacing for WDM system on the quality of the transmission

Ahmed Riad BORSALI¹, Hadjira ABRI BADAOU², Mohamed AICHI³ and Walid AICHI⁴

¹Laboratory of Telecommunications of Tlemcen (LTT), Dept Electronic, Faculty of Technology
Abou Bekr Belkaid University,
Tlemcen, PB 119, 1300, Algeria

²Laboratory STIC of Tlemcen, Dept Electronic, Faculty of Technology
Abou Bekr Belkaid University,
Tlemcen, PB 119, 1300, Algeria

³Dept Electronic, Faculty of Technology, Abou Bekr Belkaid University,
Tlemcen, PB 119, 1300, Algeria

⁴Dept Electronic, Faculty of Technology, Abou Bekr Belkaid University,
Tlemcen, PB 119, 1300, Algeria

Abstract

In this paper, we investigate the quality of the transmission of each channel for a Wavelength Division Multiplexed (WDM) system with a 640 GB/s data rate (16 x 40 GB/s) with RZ modulation for different channel spacing.

Keywords: WDM; RZ; dispersion compensating Fiber; bit error rate.

1. Introduction

Since the advent of optical communications, a great technological effort has been devoted to the exploitation of the huge bandwidth of optical fibers. Starting from a few Mb/s single channel systems, a fast and constant technological development has led to the actual 10 Gb/s per channel dense wavelength division multiplexing (DWDM) systems, with dozens of channels on a single fiber. Transmitters and receivers are now ready for 40 Gb/s, whereas hundreds of channels can be simultaneously amplified by optical amplifiers [1].

2. Description of a general optical link

multiplier into a fiber. Signals are amplified, when necessary, using amplifiers such as erbium-doped fiber amplifiers (EDFAs) to compensate for signal attenuation [2].

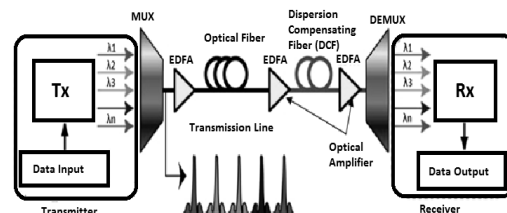


Fig.1 A typical point-to-point optical fiber communication link.

3. Presentation of the WDM system

The optical link to simulate is a network of 16 WDM