Accepted Manuscript

Title: An Approach for Realistic Estimation of BER due to Signal-Component Crosstalk in a WDM Receiver

Authors: Pinakpani Mukherjee, Santu Sarkar, Nikhil R. Das

PII: S0030-4026(17)30888-4

DOI: http://dx.doi.org/doi:10.1016/j.ijleo.2017.07.066

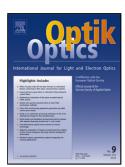
Reference: IJLEO 59462

To appear in:

Received date: 19-3-2016 Revised date: 30-7-2017 Accepted date: 30-7-2017

Please cite this article as: {http://dx.doi.org/

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



ACCEPTED MANUSCRIPT

An Approach for Realistic Estimation of BER due to Signal-Component Crosstalk in a WDM Receiver

Pinakpani Mukherjee¹, Santu Sarkar² and Nikhil R. Das³

ABSTRACT

In this paper, an approach is proposed to estimate the Bit Error Rate (BER) in a Wavelength Division Multiplexing (WDM) receiver with component crosstalk considering all possible bit combinations in the interfering channels instead of the usual worst-case approach. In addition, probability density function (pdf) and bit error rate (BER) with finite interferers are studied using a new mathematical formulation based on Maclaurin series expansion of the *N*-th power of zero order Bessel Function. This analysis results in more realistic estimation of BER and optimum detection threshold for minimum BER than that obtained using worst-case study. The improvement in accuracy of estimation of BER with the present approach over the worst-case approximation approach is more for higher crosstalk level and large number of interfering channels.

Index Terms- Wavelength division multiplexing, Component Crosstalk, optical network, Signal-Crosstalk beat noise, detection threshold, and bit error rate.

I. INTRODUCTION

Wavelength Division Multiplexing (WDM) which increases spectral efficiency of the fiber-optic transport system, has major impact on the evolution of high transmission network [1,

¹Dept. of Electronics & Communication, Academy of Technology, Adisaptagram, Hooghly, India

^{2,3}Institute of Radio Physics and Electronics, University of Calcutta, 92 A.P.C. Road, Kolkata, India Te.: +91 33 2350 9115/9116/9413, Fax: +91 33 2351 5828

¹ppmukherjee@yahoo.co.in, ²santu@ieee.org, ³nrd@ieee.org

Download English Version:

https://daneshyari.com/en/article/5025370

Download Persian Version:

https://daneshyari.com/article/5025370

<u>Daneshyari.com</u>