

VIGRE report for Fall '05

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1 General Overview

I participated in preparation for Binational Spring School on Nonlinear and Multiscale Photonics. It involved contacting the students and faculty of various US and Mexican universities. Responsible for maintaining the spring school's webpage.

In the Spring of 2005 the problem of error rate fluctuations in communication systems was continued; additional measurements were made. The data was analyzed and wanted results obtained. This work is being prepared for publishing.

My involvement in vertical integration was through work with Dr. Indik and two undergraduate students of Mathematics department Chris Summitt and Carlos Chiquette. The students were working on a problem of reconstruction of the feed from near and far field images. My goal was to help them to learn the background needed for this problem: theory of Fourier transforms, basic programming skills in Matlab.

2 Classes Taken

A Math 576B "Numerical Analysis of PDEs"

A Opti 528 "Information and Noise in Quantum Optics"

S Math 900 "Research"

In Math 576B i developed a numerical model for the problem of statistical analysis of bit error rate in high speed optical communication systems. Numerical simulations considered pulse propagation through fiber with structural disorder in the presence of temporal amplifier noise.

3 Seminars etc.

Los Alamos Days conference: "*Fluctuation of error rates in high speed optical fiber links*"

Poster Session, "Spring School: Nonlinear and multiscale Photonics" and Poster Exhibit, "Math and the Real World": *Error rate fluctuations in high speed optical fiber communication systems*