

#1

Title: Optical Modulation Technique Based on Inverse Scattering Transform for Nonlinear Dispersive Transmission Line

Instructor: Akihiro Maruta, Osaka University

Abstract: Optical pulse dynamics in nonlinear dispersive fiber can be described by the nonlinear Schroedinger equation (NLSE). Mathematically initial value problem of the NLSE can be solved by the inverse scattering transform (IST). In the project, students are asked to design a novel modulation technique based on the IST for long-haul nonlinear dispersive transmission line.

Desired prior knowledge and skill : nonlinear fiber optics, optical communication system, C&MATLAB programming

Reference : Hiroki Terauchi and Akihiro Maruta : "Eigenvalue Modulated Optical Transmission System Based on Digital Coherent Technology", CLEO-PR&OECC/PS 2013, Paper WR2-5 (Kyoto, Japan, 3, July 2013).

#2

Title: Nonlinear Property of Few Mode Fiber

Instructor: Akihiro Maruta, Osaka University

Abstract: Few mode fibers are attractive media for large-capacity transmission line. Optical pulse dynamics in a few mode fiber are affected by fiber nonlinearity as well as a single mode fiber when the launched power to a fiber is increased. In the project, students are asked to characterize the nonlinear property of few mode fibers.

Desired prior knowledge and skill : nonlinear fiber optics, optical communication system, C&MATLAB programming, measurement skills of fiber parameters

Reference : Takayoshi Mori, Taiji Sakamoto, Masaki Wada, Azusa Urushibara, Takashi Yamamoto, and Fumihiko Yamamoto, "Experimental Evaluation of Nonlinear Tolerance of Two LP Mode Fibre in Optical MIMO Transmission" ECOC2015, Mo.4.1.3.
