LIGHTWAVE PROPAGATION IN OPTICAL FIBERS AND WAVEGUIDES

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Introduction – overview of optical fibre communication technologies **12 July – 10:00-12:00**

Waveguide theory based on Maxwell's equations **13 July – 10:00-12:00**

Pulse propagation in linear optical medium **14 July – 10:00-12:00**

Training I - Calculation and MATLAB simulation of pulse broadening due to GVD **15 July – 10:00-12:00**

Pulse propagation in nonlinear optical medium **19 July – 10:00-12:00**

Training II - MATLAB simulation based on split-step Fourier method **20 July – 10:00-12:00**

Training III - MATLAB simulation based on split-step Fourier method **21 July – 10:00-12:00**

Training IV - MATLAB simulation based on split-step Fourier method **22 July – 10:00-12:00**

Abstract:

Photonic networks are constructed by optical fibers and optical devices. This course aims to provide fundamental knowledge on lightwave propagation in optical fibers and optical waveguides. This course includes a training of fiber transmission simulation based on split-step Fourier method using MATLAB. Basic electromagnetics, mathematics, and programing skills for undergraduate level, and installation/activation of MATLAB on student's computer are requested as the advance preparation.

Contents: Waveguide theory based on Maxwell's equations, pulse propagation in linear and nonlinear optical media, MATLAB simulation based on split-step Fourier method (standard single mode fiber transmission)

Short bio:

Ken Mishina received his B.E., M.E., and Ph.D. degrees in Electrical, Electronic, and Information Engineering from Osaka University, Osaka, Japan, in 2005, 2007, and 2012, respectively. In 2007, he joined Shimadzu Corporation in Kyoto, Japan. Since 2018, he has served as Associate Professor in the Department of Information and Communication Technology at the Division of Electrical, Electronic, and Information Engineering, Graduate School of Engineering, Osaka University. His research interests include optical fiber communication systems, all-optical signal processing and photovoltaics. Recently, he published conference papers regarding on machine learning based-signal processing for optical eigenvalue communications in proceedings of ECOC2020 and OFC2020 (top-scored).

Please, send a request of participation to pixnet@santannapisa.it in order to receive the link to the seminar sessions.

Seminars will be held within the framework of the Photonic Integrated Circuits, Sensors and Networks (PIXNET) Erasmus Mundus Joint Master Degree