Associative Professorship of Line Transmission Technology
TUM Department of Electrical and Computer Engineering
Technical University of Munich

TUM

Seminar

Estimation of Fiber Parameters using the Nonlinear Fourier Transform

In an attempt to improve achievable rates for optical communication systems in the high input power regime, modulation via the nonlinear Fourier transform (NFT) has attracted some attention in recent years.

In some recent publications the potential of the NFT framework for measurements of the fiber channel parameters has been highlighted as well [1-3]. In particular the estimation of dispersion and nonlinear parameters has been studied by simulation and experimental setup.

The students task would be to first get a basic grasp of the NFT by having a look at [4]. Subsequently the concepts from [1-3] should be studied.

At the end of the seminar the student should be able to give a basic introduction to the mechanisms of the nonlinear Fourier transform and give an explanation of the methods for fiber characterization described in [1-3].

[1] Fibre Model Identification for Nonlinear Fourier Transform-Based Transmission

[2] Experimental Investigation of Nonlinear Fourier Transform Based Fibre Nonlinearity Characterization

[3] Dispersion and Nonlinearity Identification for Single-Mode Fibers Using the Nonlinear Fourier Transform

[4] Information Transmission Using the Nonlinear Fourier Transform, Part One

Prerequisites

Optical Communication Systems, Nonlinear Optics (both are not stricly necessary but highly beneficial for this topic)

Advisors

Benedikt Leible