

Master's Thesis

Impairments in Practical Nonlinear Frequency-Division Multiplexing

The propagation of pulses in the optical fiber channel is modeled by a nonlinear partial differential equation, called the Nonlinear Schrödinger Equation (NLSE).

For the loss- and noiseless case, the NLSE can be solved by a tool called the Nonlinear Fourier Transform (NFT). The NFT converts the nonlinear Schrödinger channel into a number of parallel channels, similar to the Fourier Transform in wireless communication systems, which diagonalizes the convolution channel.

In theory, this gives rise to **mitigation of all linear and nonlinear interactions** in the optical fiber link. Since both noise and attenuation are present in **practical optical communication system**, we study how the NFT can be adapted to preserve its beneficial properties.

Advisors

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