

Forschungspraxis

Estimation of parameters of a correlated phase noise channel

The nonlinear interference in optical channels can be modeled as a phase noise channel with memory (see [1] and references therein), i.e.

$$y = x \cdot \exp(j\varphi) + z$$

where z is additive white Gaussian noise (AWGN), and φ is a phase noise term with Gaussian distribution but correlated in time along several transmission symbols.

This model depends on three parameters: the mean of the phase noise φ , the variance of the phase noise φ , and the variance of the AWGN z . To compute achievable rates for the channel, it is useful to design an estimator that is able to obtain these three parameters from a set of realizations of x and y . The aim of this internship is to develop such an estimator.

[1] Ronen Dar, Meir Feder, Antonio Mecozzi, and Mark Shtaif, "Properties of nonlinear noise in long, dispersion-uncompensated fiber links," *Opt. Express* **21**, 25685-25699 (2013) [Online] Available: <https://www.osapublishing.org/oe/abstract.cfm?uri=oe-21-22-25685>

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