Achievable rate of Wiener and Markov phase noise channels

The Nonlinear Schrödinger Equation (NLSE) describes propagation in optical channels. Its nonlinearity can be modeled as Gaussian phase noise with memory [1, 2]. A popular simplification of this model is the Wiener phase noise model, which has been used to compute capacity lower bounds [3]. However, the Wiener phase noise model is statistically inaccurate in the sense that it tends to a uniform distribution instead of a Gaussian one. We have recently proposed a Markov-Gaussian phase noise model that is statistically closer to the NLSE.

The goal of this thesis is to explore capacity bounds on the Wiener and Markov phase noise models and compare them.


Prerequisites

Information Theory

Advisors

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