

Master 2005

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Simulation von akustischen Unterwasser-Datenübertragungskanälen für sich bewegende Sende-/ Empfangsanordnungen

*ABSTRACT - Masterthesis*

Underwater acoustic communication is a rapidly growing field of research and engineering. The wave propagation and Doppler shift keeps a lot of hurdles for achieving high data rates and transmission robustness. Furthermore, the usable bandwidth of an underwater sound channel is typically a few kHz at large distances. In order to achieve high data rates it is natural to employ bandwidth efficient modulation.

Thus we present an upgraded version of the in [Pra04 – Master Thesis Pullarao Prasanth Kalangi] presented simulation tool, which models also the Dopplershift, rotation movement of the transmitter and receiver arrays and which provides an interface to disturb the ideal calculated parameters of the channel with statistical methods to get a more realistic result in comparison with sea experiments. The transmitter/receiver device employing Differential Coded Offset Quadrature Phase-Shift Keying (DOQPSK) modulation techniques different to those used in [Pra04] are designed to demodulate the signal without any synchronisation informations and implementing an equalizer to get better results for higher data rates. In the simulations at the end of this Thesis we present a sensitivity analysis for a not ideal to the channel matched equalizer, which gives an impression how fast an adaptive equalizer must diversify the coefficients of the equalizer to follow the change of the channel evoked by the moving transmitter/receiver.