

**Abstract:**

Underwater networks present considerable opportunities as well as technical challenges. Due to severe nature of the underwater acoustic channel, the use of OFDM signals (Orthogonal Frequency Division Multiplexing) with reduced envelope fluctuations is strongly recommendable. Although iterative clipping and filtering techniques are the most efficient way of reducing the envelope fluctuations of OFDM signals, they introduce significant nonlinear distortion effects that lead to performance degradation. In this paper we consider the ML (Maximum-Likelihood) detection of underwater OFDM signals with strong nonlinear distortion effects. It is shown that the nonlinear distortion does not necessarily mean significant performance degradation and, in fact, the ML performance could even be better than the performance with ideal, linear transmitters. We also present sub-optimum ML-based receivers that allow remarkable performance improvements, being able to reduce significantly the gap between the ML performance and the performance of conventional OFDM receivers.

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