

“Estimation and Compensation of IQ Imbalance in an SC/FDE System”, pp. 293 - 303

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Abstract – Robust communication concepts and/or synchronization algorithms represent one of the most important aspects of high rate wireless communication systems. In this work efficient concepts and algorithms for the estimation and compensation of IQ imbalance in SC/FDE (Single Carrier Systems with Frequency Domain Equalization) systems are developed. SC/FDE represents a very robust transmission concept and the underlying data structure is optimally suited for synchronization purposes. In this work we propose preamble based algorithms for the estimation and compensation of the IQ imbalance as well as algorithms based on a so called Unique Word (UW), which is part of the investigated SC/FDE transmit signal structure anyhow. Novel algorithms, which not only allow to estimate the IQ imbalance itself, but additionally allow to disburden the radio channel estimation from IQ-distortions, are introduced. It is demonstrated that the developed concepts allow to compensate the effects of the IQ imbalance almost completely – for additive white Gaussian noise (AWGN) as well as for multi-path channels.