

论文

## 一种用于水声相干通信系统的自适应均衡算法

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摘要

多通道判决反馈均衡器(MC-DFE)是水声相干通信克服信道多径效应、消除码间干扰(ISI)的主要手段。为了减少多通道数据处理的复杂性、优化算法、提高算法精度,该文提出了自适应自最优预合并多通道判决反馈均衡算法。该算法将快速自优化LMS分集合并(FOLMSDC)算法、快速自优化LMS(FOLMS)算法和快速自优化LMS相位补偿(FOLMSPC)算法有机地结合在一起,使用统一的误差信号,按照最小化均方误差(MMSE)准则调节各部分的系数,从而实现均衡器性能的全局最优。仿真试验和湖上试验对该算法的性能进行了分析。实验结果表明,该文提出的算法可以进一步减少运算量,提高通信系统的接收性能,算法性能优于已有算法。

关键词 [水声通信](#) [快速自优化LMS分集合并](#) [自适应自最优预合并多通道判决反馈均衡器](#)

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## An Adaptive Equalization Algorithm for Underwater Acoustic Coherent Communication System

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Abstract

Multi-Channel Decision Feedback Equalizer (MC-DFE) is the main method to overcome multipath fading and eliminate Inter-Symbol Interference (ISI) for underwater acoustic coherent communications. To reduce computational complexity and improve the precision of the data processing, an adaptive and self-optimized pre-combination multi-channel decision feedback equalizer is proposed which consists of Fast self-Optimized LMS Diversity Combiner (FOLMSDC), Fast self-Optimized LMS (FOLMS) and Fast self-Optimized LMS Phase Compensation (FOLMSPC). The proposed algorithm uses single error signal to adjust coefficients according to Minimize Mean Square Error (MMSE) scheme. The proposed algorithm is analyzed through simulation experiments and lake experiments. The experiment results show that proposed algorithm can further reduce computational complexity, and the algorithm performance is better than available algorithms.

Key words [Underwater acoustic communications](#) [Fast self-Optimized LMS Diversity Combiner \(FOLMSDC\)](#) [Adaptive and self-optimized pre-combination multi-channel decision feedback equalizer](#)

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