

博士论坛

OFDM系统中基于全相位算法的最大似然信道估计器

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收稿日期 2008-9-28 修回日期 2009-1-9 网络版发布日期 2009-2-28 接受日期

摘要 在OFDM系统中设计了一种基于全相位快速傅里叶变换算法的最大似然信道估计器。全相位傅里叶变换相对于快速傅里叶变换呈现平方的幅度增益性质, 在高信噪比情况下可以抑制最大似然估计器中的自带噪声, 由此能够更准确地估计出信道冲击响应, 并用来均衡信号。同时, OFDM采用全相位傅里叶变换作为解调算法克服了系统晶振不匹配以及信道传输过程中产生的频偏。在3GPP的空间信道模型下, 设计了基于全相位最大似然估计器的OFDM系统, 并与传统的最大似然估计器系统比较, 使用蒙特卡洛方法仿真证明: 信道冲击响应估计的均方误差和系统误码率均有所下降。

关键词 [最大似然信道估计器](#) [全相位傅里叶变换](#) [空间信道模型](#) [正交频分复用](#)

分类号

All-phase FFT maximum likelihood channel estimator based on OFDM system

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Abstract

This paper proposes a new Maximum Likelihood Channel Estimator (MLE) based on all-phase FFT (ap-FFT) algorithm for Orthogonal Frequency Division Multiplexing (OFDM) system. In the case that the ap-FFT algorithm has the square amplitude gain, which restrains the inherent noise in MLE at high SNR (Signal Noise Ratio), the ap-FFT MLE can get more exact channel information to equalize the distortion signal. The OFDM system that employs ap-FFT instead of FFT as demodulation algorithm also has the ability to overcome the frequency offset in system to some extent. It focuses on the performance of ap-FFT OFDM system using ap-FFT MLE in Spatial Channel Model (SCM) of the Third Generation Partnership Project (3GPP), utilizing Monte Carlo method, simulation results validate the accuracy of ap-FFT MLE over traditional MLE in terms of mean square error, and proposed system has better BER performance.

Key words [Maximum Likelihood Channel Estimator \(MLE\)](#) [all-phase FFT \(ap-FFT\)](#) [Spatial Channel Model \(SCM\)](#) [Orthogonal Frequency Division Multiplexing \(OFDM\)](#)

DOI: 10.3778/j.issn.1002-8331.2009.07.008

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