短文与研究通讯

基于训练序列的OFDM系统定时同步改进算法

黎锁平, 陈伟儒, 湛兴祥, 苏莹

兰州理工大学理学院

摘要：

本文从OFDM系统模型和同步技术作为切入点重点分析研究了基于训练序列的OFDM系统定时同步算法，针对基于SC算法构造的训练序列帧结构及所采用的定时估计算法会造成定时同步位置具有峰值平台、定位点模糊、定时同步不够精确的缺点，提出了一种基于SC算法的改进型训练序列帧结构及改进算法。该算法对SC算法中训练序列前后两部分的搬移重复结构进行改进，构造了前后两部分呈中心对称的训练序列帧结构。改进算法不再采用SC算法中训练序列的后半部分来定义能量函数，而是采用整个训练序列长度来定义能量函数，从而构建同步度量函数，找到最佳定时同步估计点并完成定时同步。理论分析和仿真结果表明，改进算法解决了SC算法定时同步估计位置模糊、定时同步不精确的问题，改进后的算法能够确保定时同步的精确性。

关键词：　OFDM系统；　定时同步；　训练序列；　SC算法；改进算法

Improved Timing Synchronization Algorithm for OFDM System Based on Training Sequence

LI Suo-Ping, CHEN Wei-Ru, ZHAN Xing-Xiang, SU Ying

School of Science, Lanzhou University of Technology

Abstract:

This paper uses OFDM system model and synchronization technology as the entry point to carry on the research of timing synchronization algorithm of OFDM systems based on training sequence. Due to the drawbacks of timing estimation algorithm which based on the training sequence frame structure of SC algorithm has a peak plateau in timing estimation, timing position ambiguity and can't make a precise time estimation, this paper presents an improved training sequence frame structure and algorithm based on SC algorithm. This paper improves the repetitive structure of the first part and the second part in the training sequence structure of SC algorithm. The improved training sequence frame structure uses Centro-symmetric structure of the first part and the second part. The improved algorithm doesn't use the second part of the training sequence of SC algorithm to define the energy function, while uses the whole part of the improved training sequence to define the energy function. And then establishes a timing metric function and finds the best timing synchronization point to finish timing synchronization. Both the theory analysis and the results of simulation show that timing position ambiguity and imprecise timing synchronization of SC algorithm can be solved by the improved algorithm. The improved algorithm can ensure the precision of timing synchronization.

Keywords: OFDM system　timing synchronization　training sequence　SC algorithm；improved algorithm

通讯作者：

作者简介：

作者Email: spingl@yeah.net

参考文献：

本刊中的类似文章

文章评论

反馈人		邮箱地址	
反馈标题		验证码	3399

Copyright by 信号处理