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论文

一种新颖的低计算复杂度OFDM符号细同步算法

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摘要:

本文针对基于重复共轭对称结构前导的OFDM系统, 提出了一种新的符号细同步算法。新提出的算法基于延迟相关、延迟相乘和对称相关, 设计出定时度量1和定时度量2, 在利用定时度量2搜索出其峰值位置的基础上, 利用定时度量1确定出多径信道中的第一径。和传统的基于重复共轭对称结构前导的定时方法相比, 新提出的算法在具有较低计算量的同时, 消除了传统方法中的定时模糊问题, 并有效减小了多径信道条件下的定时位置偏移。在6径典型市区信道条件下的仿真结果表明, 新提出的同步方法可获得准确的符号同步性能。该方法适用于连续和突发OFDM系统的同步。

关键词: 延迟相关 OFDM 对称相关 细同步

A Novel and Low-Complexity Fine-Timing Synchronization Method for OFDM Systems

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Abstract:

This paper proposes a new fine-timing synchronization method for OFDM systems based on repeated-conjugated-symmetric preamble. The proposed timing method utilizes delayed correlation, delayed product and symmetric correlation to design timing metric 1 and timing metric 2. Firstly, timing metric 2 is used to make initial timing synchronization according to its maximum value, and then timing metric 1 is used to find the first tap of multipath channel. Compared to the conventional timing synchronization method based on the conjugated-symmetric correlation, the proposed method has a low computational load and eliminates the timing ambiguity of conventional synchronization method caused by side peaks of the timing metric. Moreover, the proposed method can decrease efficiently the timing offset in multipath channel. Simulation results in 6-path channel for typical urban show that the proposed method achieves accurate timing performance. The proposed method is adapted to an OFDM system using either a continuous transmission or a burst operation.

Keywords: delayed correlation OFDM symmetric correlation synchronization

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