

应用

一种基于黎曼序列降低PAPR的新方法

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摘要:

正交频分复用 (OFDM) 可以有效地对抗多径衰落, 能够以较高的频谱利用率来实现高速数据传输, 已成为通信领域的研究热点。但是OFDM技术中存在的高峰均功率比 (PAPR), 为其实用化设置了障碍。本文在总结了目前国内降低PAPR多种技术的基础上, 给出了PAPR的定义和分布, 分析了选择映射算法的基本原理, 并提出了一种基于黎曼序列降低峰均功率比的新方法, 其核心思想是选择归一化黎曼矩阵的行向量作为相位序列。最后进行了蒙特卡罗仿真, 仿真结果表明, 该方法能够明显改善OFDM信号的PAPR特性, 降低了计算的复杂度, 提高了频带利用率。

关键词: 正交频分复用; 峰均功率比; 选择映射算法; 黎曼序列

A New Scheme for PAPR Reduction Using Riemann Sequences

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Abstract:

Because of high spectrum efficiency and robustness to multi-path delay, Orthogonal Frequency Division Multiplexing (OFDM) has been focused on in communication research. But the disadvantage of High Peak-to-Average Power Ratio (PAPR) in OFDM technology is one of the main obstacles to limit its wide applications. Various techniques on reducing the PAPR are summarized in this paper firstly, and the definition and distribution of PAPR are introduced. The basic principle of Selected Mapping (SLM) is analyzed. Then the algorithm of using Riemann Sequences to reduce the PAPR is proposed. The main idea of the algorithm is to select row vectors of the normalized Riemann matrix as phase vectors. Some results are obtained by Monte Carlo simulations, and it is proved that this algorithm has better performance for reducing the PAPR of OFDM signals. The computational complexity is reduced, and the bandwidth efficiency is improved.

Keywords: Orthogonal Frequency Division Multiplexing Peak-to-Average Power Ratio Selective Mapping; Riemann Sequences

收稿日期 2010-07-13 修回日期 2010-11-19 网络版发布日期 2011-01-25

DOI:

基金项目:

上海市教委科研创新项目 (09ZZ185) 和上海市科学技术委员会基金 (10PJ1404500)联合资助

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