

论文

OFDM系统中峰均比降低的次优化循环移位序列方法

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摘要:

部分传输序列(PTS)方法需遍历所有的可选相位因子, 这样的计算量随分割子序列数按指数增长。本文在对循环移位PTS方法(PTS/CSS)和次优PTS方法(sub-OPTS)进行研究的基础上, 提出了一种减少计算复杂度的次优化时域循环移位序列方法(sub-OPTS/CSS)。该方法用快速傅立叶变换(FFT)的时域循环移位特性增加更多备选信号; 且仅对变换后的部分备选信号进行相位优化。同时, 将其与已有的一些方法的备选信号、冗余比特数、运算量进行了分析和比较。理论分析和仿真结果表明, 当使用相同的分割子序列数和相位旋转因子时, sub-OPTS/CSS方法降低PAPR的性能稍次于PTS/CSS方法, 但搜索最佳相位时的计算量减少了一半; sub-OPTS/CSS方法降低PAPR的性能要优于sub-OPTS方法。

关键词: 正交频分复用 峰均比 部分传输序列 循环移位

Sub-Optimum Cyclically Shifted Sequences for PAPR Reduction in OFDM Systems

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Abstract:

Partial transmit sequence (PTS) method requires the exhaustive search over all combinations of allowed phase factors, and the search complexity increases exponentially with the number of sub-blocks. To solve this problem, on the basis of studying cyclically shifting partial transmit Sequences (PTS/CSS) and Sub-optimum PTS method (sub-OPTS), a sub-optimal cyclically shifted sequence (sub-OPTS/CSS) method is presented. In our scheme, a cyclic shift of the fast Fourier Transform (FFT) in the time domain is employed to improve the PAPR reduction performance. Furthermore, phase factors are optimized only for latter half of candidates, so as to reduce the complexity. The comparison of sub-OPTS/CSS method with some methods is carried out from the number of candidates, the redundancy and the computational coats. The analysis and simulation results show that, in the case of the same number of sub-blocks and phase weighting factors, sub-OPTS/CSS is almost the same as the performance compared with PTS/CSS method while the processing time of iteration is reduced by 50%. Sub-OPTS/CSS achieves better performance than sub-OPTS method.

Keywords: OFDM Peak-to-average power ratio (PAPR) Partial transmit sequence (PTS) Cyclic Shift

收稿日期 2009-03-10 修回日期 2009-10-16 网络版发布日期 2010-05-25

DOI:

基金项目:

*教育部“春晖计划”基金(Z2006-1-62006)、甘肃省自然科学基金(0809RJA019)、甘肃省高校研究生导师科研基金(0703-10)资助

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