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一种随机极性MCP-EBPSK调制解调器

靳一* 吴乐南 冯熳 邓蕾*

东南大学信息科学与工程学院 南京 210096

An MCP-EBPSK Modem with Random-polar

Jin Yi Wu Le-nan Feng Man Deng Lei*

Department of Information Science and Engineering, Southeast University, Nanjing 210096, China

摘要 为改善随机极性的连续相应的扩展二元相移键控(CP-EBPSK)调制信号的频谱结构，该文提出一种带功率谱形状调节系数的随机极性修正CP-EBPSK (Modified CP-EBPSK, MCP-EBPSK)调制解调器。阐述了随机极性MCP-EBPSK调制的基本原理，给出了无随机极性的MCP-EBPSK调制理论功率谱表达式。同时，设计了合适的数字冲击滤波器用于解调，给出了无编码的随机极性MCP-EBPSK通信系统框图，分析和验证了该类调制信号的功率谱特性和解调性能，并对多径信道上的解调性能进行了仿真。仿真结果表明：新的调制方式通过对功率谱形状的调节，不仅频谱利用率更高，解调性能也更好；现阶段，该系统不适合在无线信道传输，有望在有线信道上率先获得应用。

关键词： 连续相位的扩展二元相移键控(CP-EBPSK) 功率谱调节系数 MCP-EBPSK 数字冲击滤波器

Abstract： In order to improve the spectral structure of random-polar modulated Extended Binary Phase Shift Keying with Continuous Phase (CP-EBPSK), a random-polar and Modified CP-EBPSK (MCP-EBPSK) with the adjustment coefficient of spectrum shape is proposed. The principle of random-polar modulated MCP-EBPSK is demonstrated, and the theoretical spectrum expression of MCP-EBPSK is given. Meanwhile, digital impacting filters appropriate for demodulation are designed, the block diagram of random-polar modulated MCP-EBPSK communication system without channel code is given, the power spectrum characteristic and demodulation performance of such modulated signals are analyzed and verified, and the demodulation performance of multipath channel is also simulated. Simulation results show that: by the adjustment of spectrum shape, the new modulation method is promising not only in higher spectrum efficiency, but also better in demodulation performance; At present, this system is not suitable for wireless channel, and is hoped to be applied to cable channel firstly.

Keywords： Extended Binary Phase Shift Keying with Continuous Phase (CP-EBPSK) Adjustment coefficient of power spectrum Modified CP-EBPSK (MCP-EBPSK) Digital impacting filter

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通讯作者: 靳一 Email: john.0216@163.com

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