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## 算法研究

### 一种非数据辅助的连续相位调制信号符号速率估计算法

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摘要:

在对连续相位调制信号(Continuous Phase Modulation, CPM)的循环平稳性分析的基础上, 本文推导了其谱频率为载频的循环截面上离散谱线与调制参数的关系, 提出一种非数据辅助的CPM信号符号速率估计算法。该算法采用频域谱平滑的方法得到循环谱估计, 利用非线性滤波方法进行离散谱线提取, 根据信号的谱线特征, 判断信号为单指数或多指数CPM信号, 进而得到符号速率的有效估计。仿真实验结果表明, 该算法不需精确载频估计, 具有较好的抗噪声性能, 并能用于频率选择性衰落信道。

关键词: 连续相位调制(CPM); 多指数CPM; 循环谱; 符号速率估计

## A Non-data aided Algorithm for the Symbol Rate Estimation of CPM Signals

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Abstract:

In this paper, a new non-data aided algorithm of the symbol rate of CPM signals is proposed. It is based on the observation that the discrete lines and the modulation parameters are mainly related on the carrier frequency-profile. This algorithm employs the frequency smoothing method to get the estimation of the cyclic spectrum, and adopts nonlinear filtering to extract discrete lines on the cyclic profile. According to the characteristics of cyclic spectrum, single-h signals and multi-h ones are distinguished, and the symbol rate of CPM signals is accurately estimated. Simulation results show that the algorithm can be implemented without precise estimation of carrier frequency. In addition, it has good noise resistant performance, and can be applied to frequency-selective fading channels.

Keywords: CPM Multi-h CPM Cyclic Spectrum; Symbol Rate Estimation

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