

一种新型的认知无线电频谱空穴自适应检测算法

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A New Adaptive Detection Algorithm of the Spectrum-hole on Cognitive Radio

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摘要

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摘要 根据认知无线电实际频谱需求,通过对弱信号检测技术的研究,该文首次在认知无线电领域提出了一种基于三重矩阵累积估计的频谱空穴检测算法,该算法将频域块自适应滤波与矩阵重构、累积估计和频域平滑相结合实现弱信号检测。最后以QPSK调制信号为例进行了算法的计算机仿真,给出了性能分析。仿真结果表明该检测算法能够快速有效地实现弱信号检测并具有较高的检测概率,完全可以应用于认知无线电的频谱空穴检测。

关键词: 认知无线电 频域块自适应滤波 频谱空穴 矩阵累积估计

Abstract: According to the actual spectrum demand of cognitive radio, a new spectrum-hole detection algorithm, which bases on triple matrix accumulation, is presented for cognitive radio systems for the first time by the study on weak signal detection technology. The algorithm combines spectrum-domain block adaptive filtering with matrix reshape, accumulate products estimation and frequency-domain smoothing to realize the weak signal detection. Finally, the performance of the algorithm is analyzed and simulated by using a QPSK signal. The result shows that the detection technology can detect weak signal quickly and effectively, and has a higher detection probability. The detection technology may be applied wholly to cognitive radio field.

Keywords: Cognitive radio Block-FFT adaptive filtering Spectrum hole Matrix accumulation estimation

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