

直扩系统中IIR格型滤波器抑制窄带干扰新方法 with 性能分析

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A Novel Method of Narrow-band Interference Suppression Using IIR Lattice Filter in DSSS and Its Performance Analysis

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摘要

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摘要 该文提出一种直扩系统中基于IIR格型陷波器时域频域相结合的窄带干扰抑制新方法, 该方法采用时域频域并行处理的结构, 通过最优加窗和频谱校正技术在频域精确估计出干扰信号的频率, 根据频率估计误差和干信比求出最优陷波带宽, 由此自适应地调整时域IIR格型陷波器的参数。分析和实验表明, 该方法较传统的自适应IIR窄带干扰抑制方法不仅具有更高的稳定性和实时性, 而且在干扰得到有效抑制的情况下使有用信号的损失达到最小。

关键词: 直接序列扩频通信 窄带干扰 IIR格型陷波器 陷波带宽

Abstract: A novel Narrow-Band Interference (NBI) suppression method of IIR lattice notch filter based on the combination of NBI suppression in both time and frequency domain in DSSS is proposed. This method is implemented in a parallel processing structure. The frequency of NBI signal is accurately obtained by employing optimal window functions in the time domain and spectrum correcting method in frequency domain. The optimal rejection bandwidth of IIR notch filter in the frequency domain is obtained adaptively according to the error of frequency estimation and interference to signal ratio. Then the IIR notch filter coefficients are adjusted timely and adaptively. Analysis and results of the experiment show that the proposed method has better stabilization and real-time property than traditional adaptive NBI suppression methods of IIR, and minimizes the distortion of the signal in the full suppression of narrow-band interference.

Keywords: DSSS Narrow-Band Interference (NBI) IIR lattice notch filter Rejection bandwidth

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