

单通道最优恒模自适应干扰抑制方法

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Adaptive Interference Suppression Based on Single-channel Optimal Constant Modulus Algorithm

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摘要

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摘要 针对民航地空通信中常见干扰具有恒定包络的特点, 该文提出了一种基于单通道最优恒模算法的自适应干扰抑制方法。该方法利用干扰信号的恒模特性, 采用非线性最小二乘的方法对干扰信号的幅度与相位进行估计, 并将其与接收到的混合信号相减, 从而实现了恒模干扰信号的抑制。该方法与现有民航地空通信系统具有较好的兼容性, 无需额外增加通道, 且避免了一般自适应干扰抑制算法中的收敛问题。仿真和实测数据的处理结果表明该方法具有较好的干扰抑制效果。

关键词: 民航通信 单通道 最优恒模算法 自适应干扰抑制 恒模阵列 非线性最小二乘

Abstract: Taking account of the constant modulus characteristic of most interference signals in civil aviation air-to-ground communication, a single-channel optimal constant modulus algorithm is proposed. In this algorithm the amplitude and phase of the constant signal are estimated with nonlinear least squares method. Interference suppression is realized by subtracting the constant modulus signal from the mixed signal. This method has good compatibility with existing communication systems, and the number of channel is not increased. The convergence problem of the adaptive interference suppression can be avoided. Simulation and experimental results are provided to demonstrate the performance of the proposed method.

Keywords: Civil aviation communication Single-channel Optimal constant modulus algorithm Adaptive interference suppression Constant modulus array Nonlinear least squares

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