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论文

STC-OFDM系统中基于扩展贝叶斯滤波的鲁棒共信道干扰抑制算法研究

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摘要
空时编码正交频分复用(STC-OFDM)系统易受共信道干扰(CCI)影响，利用波束成形可以抑制共信道干扰的影响。然而，目前存在的一些方法都是基于期望信号波达方向(DOA)的精确估计的。实际上，当期望信号的波达方向存在误差时，这些波束成形器的性能将明显下降。为此，该文提出了基于扩展贝叶斯滤波的鲁棒波束成形算法来提高当期望信号的波达方向存在误差时的系统性能。在这一算法中，每一个期望信号的波达方向被看成一个由若干离散样点组成的随机变量。利用贝叶斯公式对这些样点的后验概率进行估计，当有样点的后验概率低于一定的门限值时，对这些样点进行重采样，使有效样点的数目保持恒定。最后，波束成形器的最优权值由这些样点的后验概率加权获取。仿真结果表明，该文算法对抑制多径信道中STC-OFDM系统的共信道干扰具有很强的鲁棒性。

关键词 空时编码正交频分复用 共信道干扰 波束成形

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Research of Suppressing the Co-channel Interference in STC-OFDM with Robust Algorithm Based on Extended Bayesian Filter

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Abstract
It is well known that Space-Time Coded Orthogonal Frequency Division Multiplexing (STC-OFDM) is easy to be affected by the Co-Channel Interference (CCI) and it is effective to mitigate CCI by beamforming. However, the existing methods are based on the accurate estimation of source Direction-Of-Arrival (DOA). In fact, the performance of system will degrade significantly when there is error in the estimation of DOA. In this paper, a robust algorithm based on Extended Bayesian(E-Bayesian)filter is proposed to improve the performance of the beamformers with uncertainty or error in desired DOA. In this algorithm, each DOA of desired signal is regarded as a random variable composed by several discrete samples. The posterior probability of these samples will be estimated by Bayesian formula and the samples will be resampled when some posterior probability is under certain threshold. Then, the optimized weights are determined by the posterior probability of these samples. Simulation results show that the proposed algorithm can significantly improve the robustness of the beamformers to combat the co-channel interference over Rayleigh multipath fading channel.

Key words Space-Time Coded OFDM (STC-OFDM) Co-Channel Interference (CCI) Beamforming

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