

论文

异步DS-CDMA系统盲空时信道估计及多用户检测

胡兵, 李平安, 俞卞章

西北工业大学电子信息学院 西安 710072

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摘要

该文提出了适用于频率选择性瑞利衰落信道中的异步DS-CDMA系统盲空时信道估计及多用户检测算法。通过研究多径信号码空间和数据矢量空间, 采用噪声子空间技术进行异步DS-CDMA系统盲空时信道参数估计, 同时利用了多径传播和接收机同步失调的特性, 以利于把盲线性滤波优化技术应用于稳健的干扰抑制。使用一种修改的ULV更新算法进行噪声子空间跟踪, 该算法不需要相关矩阵的秩估计, 直接估计噪声子空间, 不进行信号子空间跟踪。并且研究了线性约束最小方差(LCMV)盲空时多用户检测及其基于Householder变换约束最小均方算法(HCLMS)的自适应实现。仿真结果验证了该文算法的有效性。

关键词 [DS-CDMA](#) [盲空时多用户检测](#) [空时信道估计](#) [失配](#)

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Blind Space-Time Channel Estimation and Multiuser Detection for Asynchronous DS-CDMA System

Hu Bing, Li Ping-an, Yu Bian-zhang

School of Electronic Information, Northwestern Polytechnical University, Xi'an 710072, China

Abstract

The blind space-time channel estimation and multiuser detection algorithm for asynchronous DS-CDMA system in frequency selective Rayleigh fading channel are presented. By investigating the code space of the multipath signals and the data vector space, the noise-subspace-based approach is used to perform blind channel parameter estimation in the asynchronous DS-CDMA system. The method exploits not only the characteristics of multipath propagation but also the characteristics of timing-offsets which may occur in the receiver, to facilitate the application of a blind linear filter-optimization technique to robust interference suppression. A modified ULV updating algorithm is applied to performing noise subspace tracking. The algorithm does not require rank estimation of the correlation matrix, and estimate directly the noise subspace without tracking the signal subspace. Furthermore, Linearly Constrained Minimum Variance (LCMV) blind space-time multiuser detection and its adaptive implementation based on Householder-transform constrained least-mean-square (HCLMS) algorithm is considered. Simulation results show the effectiveness of the proposed algorithms.

Key words [DS-CDMA](#) [Blind space-time multiuser detection](#) [Space-time channel estimation](#) [Mismatch](#)

DOI:

通讯作者

作者个人主页 胡兵; 李平安; 俞卞章

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