用于MMSE合并的受约束LMS算法分析

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摘要　　建立了受约束最小均方(LMS)算法，实现正交频分复用(OFDM)系统中分集信号的自适应最优(MMSE准则)合并，解决了输入信号高度相关时传统自适应算法的收敛速度问题．对接收到的分集信号进行变换，使其具有相同的期望响应，然后并行送入自适应滤波器，在给定的约束条件下，完成分集信号的自适应最优合并．推导出的解析式表明，算法的收敛性能与输入信号的自相关矩阵无关，完全由归一化的步长参数控制．

Analysis of a constrained LMS algorithm for MMSE combination

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Abstract

A Constrained least-mean-square (LMS) algorithm is proposed, which is used for an adaptive optimum combination(MMSE criterion) of diversity signals in orthogonal frequency-division multiplexing (OFDM) systems. Compared with the conventional algorithm, the proposed algorithm has no drawback of slow convergence speed when the input signals are highly correlated. Before the received diversity signals are fed to the adaptive filter, they are transformed to have the identical desired response. Then, the transformed signals are optimally combined in the adaptive filter subject to the proposed constraints. The derived analytical expressions indicate that regardless of the input signal correlation matrix, the convergence behavior of the proposed algorithm, in all cases, is only governed by the normalized step size.

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