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MB-OFDM UWB系统的自适应联合均衡方案

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摘要 提出了一种自适应联合均衡(AJE)方案，对接收到的多带正交频分复用超宽带(MB-OFDM UWB)时频分集信号，利用自适应滤波器实现最优合并(MMSE准则)．该方案不需要知道信道参数，也就不需要进行信道估计，既减小了运算复杂度，也避免了信道估计误差的引入．该方案用最优线性合并归一化最小均方(OLC-NLMS)算法实现．利用了UWB信道慢衰落的特点，在输入信号高度相关的情况下，算法仍能快速收敛．仿真结果显示:与需要信道参数的传统最优合并方法相比，在10^{-2}误比特率，2分集和4分集时，分别获得1.2dB和2.7dB增益．

关键词 自适应联合均衡 多带正交频分复用 最优合并 超宽带

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Adaptive joint equalization for MB-OFDM UWB systems

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Abstract

An adaptive joint equalization (AJE) scheme for the muti-band OFDM ultra wideband (MB-OFDM UWB) system is proposed. For received diversity signals, the scheme can provide optimum combining (MMSE criterion) with an adaptive filter. Different from conventional optimum combining schemes, this scheme does not need channel parameters. Therefore, the corresponding computation and error caused by channel estimation are avoided. The scheme is implemented using the optimal linear combining normalized least mean squares (OLC-NLMS) algorithm. To deal with the high correlations of inputs, the characteristic of slow fading of UWB channels is applied to the algorithm, which leads to a high convergence rate. Simulation results show that compared with conventional optimum combining scheme, this scheme can result in the gain of1.2dB and2.7dB for two diversity branches and four diversity branches respectively at the 10⁻² BER (bit error rate).

Key words adaptive joint equalization muti-band OFDM optimum combining ultra wide-band

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