

电子技术

分布式MIMO系统中基于矩阵分割的检测算法

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摘要:

针对分布式多输入多输出(multiple input multiple output, MIMO)系统中由于收发天线在地域上的离散分布所引起的异步接收问题, 提出了一种基于矩阵分割的串行检测算法。该算法先从等效信道矩阵中划分出较小的矩阵, 然后在此矩阵内进行检测。检测出的结果, 部分用于干扰消除, 部分用于和之后的检测结果合并。最后, 从干扰消除后的信道矩阵中再划分矩阵, 重复检测步骤, 直至所有信号被检测出。在瑞利衰落信道下的计算机仿真表明, 该算法与已有的分布式天线下的排序干扰对消(distributed antenna ordering successive interference cancellation, DA-OSIC)检测算法相比, 可支持信号的连续发送, 且随着发送序列的增长, 算法性能逐步逼近DA-OSIC算法, 并具有较低的计算复杂度。

关键词: 分布式天线系统 多输入多输出 联合检测 矩阵分割 异步接收

Detection scheme based on matrix partition for distributed antennas MIMO systems

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Abstract:

Aiming at the problem of the asynchronous receiving for distributed antenna multiple input multiple output systems, a serial detection scheme based on matrix partition is proposed. Firstly, a smaller matrix is partitioned from the equivalent channel matrix, from which, signals are detected. Then the first of the detected signals is used for interference cancellation, and the remainder is used for combination. Finally, another small matrix is partitioned from the channel matrix cancelled the interference. This process is repeated until all the signals are detected. Some computer simulation results under the single-path Rayleigh fading channel show that the proposed detection scheme supports the successive transmission of signal compared with the exiting distributed antenna ordering successive interference cancellation (DA-OSIC) algorithm. Meanwhile, as the length of signal sequence being large, the proposed algorithm has the same performance as the DA-OSIC scheme and has lower complexity.

Keywords: distributed antenna system (DAS) multiple input multiple output (MIMO) joint detection matrix partition asynchronous receive

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