

通信与网络

基于STBC的双层预编码MIMO系统

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摘要:

提出一种结合空时分组码(space-time block coding, STBC)与双层预编码的方法。建立了基于STBC的双层预编码多输入多输出(multiple input multiple output, MIMO)系统模型, 给出了预编码赋形权矢量的构造方法, 利用预编码形成的两个虚拟子信道同时传输两个数据流, 同时结合Alamouti STBC构成混合编码, 带来分集增益; 针对STBC双层预编码系统设计了一种低复杂度的译码方法。理论和仿真结果表明, 新系统可以同时带来分集增益和复用增益, 有效提高系统信道容量, 与通常的MIMO系统相比, 误码性能得到明显改善。

关键词: 预编码 空时分组码 双层传输 多输入多输出

Dual-layer precoding MIMO system based on STBC

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Abstract:

A system that integrates space-time block code (STBC) into the dual-layer precoding is proposed. A dual-layer precoding multiple input multiple output (MIMO) system model based on STBC is established and its beamforming vector is calculated. On two virtual sub-channels formed by precoding, two data streams are transmitted simultaneously. Then, combined with Alamouti STBC, the hybrid system can also get the diversity gain. A reduced complexity decoding algorithm is designed for the STBC dual-layer precoding system. Theoretical analysis and simulation results show that the new system can achieve diversity gain and multiplexing gain simultaneously, and also improve the channel capacity effectively. The performance of the proposed scheme greatly gains over the usual MIMO system.

Keywords: precoding space-time block coding(STBC) dual-layer transmit multiple input multiple output (MIMO)

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