



MIMO-CDMA系统中的相位编码技术

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Phase coding technology used in MIMO-CDMA system

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摘要

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摘要 在角扩散不充分的贫散射环境中,MIMO(Multiple In Multiple Out)系统的信道传输矩阵的奇异值分布不均匀,导致系统容量下降.针对这个问题提出了一种相位编码技术.通过人为地制造多径,将贫散射环境下的病态相关矩阵改造为良态矩阵,从而使MIMO技术能够在天线间空间相关性很强的平坦衰落信道环境中应用,扩展了MIMO技术的应用范围;并且在发端没有信道信息的情况下仍然能够把MIMO信道等效为独立并联信道,省去了预编码和信道信息的反馈,降低了系统复杂度.从理论上分析和介绍相位编码技术的基本原理,给出仿真结果,其结果与理论分析一致.

关键词: 码分多址 多入多出系统 信息论

Abstract: In non-rich scattering propagation environment due to lack of angular spreading, non-uniform distribution of singular values of multiple in multiple out(MIMO) system transmission matrix causes a degradation of system capacity. To solve this problem a technology called phase coding was proposed. Phase coding transformed original singular channel transmission matrix to the non-singular matrix by creating multi-path deliberately. Distribution of transmission matrix singular values was improved and system capacity was improved as well. Using phase coding MIMO technology can be applied in the flat fading channel environment which has a very strong spatial correlation. So the application range of MIMO technology is expanded. Furthermore, MIMO channel can be transformed into parallel sub-channels without pre-coding at transmitter and feedback channel information from receiver, so system complexity is reduced. First theoretical analysis and basic principle of phase coding was discussed, followed with simulation results which verify theoretical analysis.

Keywords: [code division multiple access\(CDMA\)](#) [multiple in multiple out\(MIMO\)](#) [information theory](#)

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