國　立　交　通　大　學

電信工程學系碩士班

碩士論文

寬頻分碼多工系統中多路徑干擾消除與多重碼干擾消除

接收機架構之效能比較

A Comparison on MPIC and MCIC Receiver Architectures

for Wideband CDMA Communications

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摘要

WCDMA是目前已進入商業化的多重進接方式，在CDMA的系統運用之中，多用戶偵測技術能降低來自其他用戶的干擾訊號，在系統容量上有顯著的效能提升，而多路徑干擾消除與多重碼干擾消除的接收機架構既是應用多用戶偵測的原理，使系統的整體效能提升。本論文以犁耙式接收機分別結合平行多路徑干擾消除與多重碼干擾消除技術，並配合通道估測，以期系統效能有更好的提升。接收機本身架構為一個多層級的平行多用戶接收機，每一層級均有匹配濾波器及通道估測單元來實現資料偵測、訊號重建、干擾重建與消除及通道估測等估能。在每一層級中，消除由前一層級所重建之資料訊號，因而可以減少路徑或用戶之間的干擾，使系統效能增強。最後，藉由電腦模擬進行兩種接收機效能的系統模擬以及動態狀況下的效能分析。

A Comparison on MPIC and MCIC Receiver Architectures for Wideband CDMA Communications

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Abstract

Wideband code division multiple access (WCDMA) is a promising technology for wireless communication system. For WCDMA system, the multiuser detection techniques could reduce the interference from other users and provide significant enhancement in system capacity. There are also some similar techniques for multiuser detection. In this thesis, we would compare multipath interference cancellation (MPIC) with multicode interference cancellation (MCIC) associated with orthogonal code-multiplexing that achieves higher throughput than 2 Mbps for high speed packet transmission in WCDMA system and evaluate their throughput performance by computer simulation. The simulation results elucidate that sufficient multipath interference suppression is achieved by multi-stage MPIC and MCIC receiver architectures.