

# 時變通道於軟體無線電平台之研究與實現

## Study and Implementation for Time-Varying Channel in SDR Platform

洪東興

\*高誌陽

陳庭薇

陳詩穎

Dung-Shing Hung

\*Chih-Yang Kao

Ting-Wei Chen

Shih-Ying Chen

銘傳大學-電腦與通訊工程學系

Department of Information and Telecommunications Engineering,

Ming Chuan University

Email: cykao@mail.mcu.edu.tw

### 摘要

為了了解發射機與接收機在不同通道下的效應、不同介質的影響、訊號輸入與輸出後的差異，本研究將實踐時變通道並研究其性能，進行收發機、通道效應模擬器之實現與測試，以觀察通訊傳輸受到通道效應的影響。利用產生實際調變訊號，對發射訊號加入干擾通道效應，以製造實際在傳輸過程中所通道環境的影響，包括都卜勒效應、多路徑效應、訊號衰弱、訊號干擾…等狀況。以傳輸圖片來分析、研究傳輸前後的差異，確認是否可於接收端完整呈現。不同通道效應之接收圖形樣貌於此研究中會產出，於未來利用所接收圖形的樣貌，就可以約略的估測通訊系統之信號所經過的通道效性為何。

關鍵字：無線通道模擬器、時變通道、非時變通道。

### Abstract

Qualities of the wireless transmission are affected by the channel states, which are composed from multipath signals and their propagation. In order to understand the channel effects between transmitters and receivers, this study builds the time-varying channel model from time-invariant channel model to observe the transmission performance. Channel emulator is implemented to test the media transmission qualities through digital modulation scheme. Intersymbol interferences are also emulated in software defined radio (SDR) platform to evaluate the computer simulation results. Use received viewable media to analyze and study the channel effect not just the algorithms or waveform. The reception pattern of different channel effects will be produced in this study. In the future, the comparison of the received patterns can be used to roughly estimate the channel effectiveness of the wireless communication system signal.

Keyword: wireless channel emulator, time-varying channel, time-invariant channel

\*通訊作者