

SILVA, Mário Marques da - *Multi-User Detection for DS-CDMA Systems*. Lisboa: Instituto Superior Técnico da Universidade Técnica de Lisboa, 1999. MSc Thesis

Abstract: The main purpose in wireless communications is to allow high data rates, low delays, high net capacity and flexibility in services. The Direct Spreading – Code Division Multiple Access (DS-CDMA) technology is the main key to combat several sources of interference.

The Intersymbol Interference (ISI) tends to increase with the increase in the symbol rates. To combat the ISI, this thesis improve the ISI Cancellation System, named “Commutation Signaling”. Additionally, presents the use of DS-CDMA technology, and because all the spectrum is available to all users at the same time, there is Multiple Access Interference (MAI), which is caused because several spreading codes used by several users are not received by one reference user perfectly orthogonal.

This thesis studies Subtractive Multi-User Detectors (SIC – Successive Interference Cancellation, and PIC – Parallel Interference Cancellation) without and with the ISI Cancellation System – Commutation Signaling. Additionally, studies the detection with Noise Whitening Matched Filter (NWMF) that combats the MAI with the whitening of the interference power spectrum, and so, following the Single-User strategy, also without and with the ISI Cancellation System – Commutation Signaling.