

ABSTRACT

The developments of wireless communication system emphasis to support services due to rapid data rate while give best working performance into high user mobility. Rapid data rate required broad bandwidth, this situation is extremely vulnerable to the selective and fast fading.

Multi Carrier Code Division Multiple Access (MCCDMA) system used to solve broad bandwidth requirement, MCCDMA system will use orthogonal subcarrier to efficient the bandwidth. High user mobility will be very vulnerable to air interface disturbance, *Adaptive Subcarrier Hopping* is expected to be a solution for this problem. MIMO (*Multiple Input Multiple Output*) non-coherent DSTBC (*Differential Space Time Block Code*) is also use to improve the system performance by the presence of diversity gain.

This Final assignment is done by analyze the impact of adaptive subcarrier hopping technique and MIMO DSTBC in MCCDMA system also by analyze reliability of *adaptive subcarrier hopping* MIMO-DSTBC-MCCDMA by comparing conventional system in channel condition in which are selective fading and fast fading on variation user velocity for 50 km/h, 80 km/h and 120 km/h. Result of this simulation show the impact of *adaptive subcarrier hopping* to MCCDMA system provide improve performance for ± 8.85 dB and ± 2.7 dB when its use MIMO-DTSBC into the MCCDMA system. Improvement of system performance for ± 12.53 dB in *adaptive subcarrier hopping* MIMO-DSTBC-MCCDMA when its compare to MIMO-DSTBC-MCCDMA system and ± 7.83 dB when it is compare to *adaptive subcarrier hopping* MCCDMA.

Keywords : *selective fading, fast fading, diversity gain, MCCDMA, Adaptive Subcarrier Hopping, MIMO, DSTBC.*