UNIVERSITI TEKNOLOGI MARA

SISO AND MIMO THROUGHPUT ANALYSIS FOR LONG TERM EVOLUTION (LTE)

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ABSTRACT

This dissertation provides the analysis and comparison of data throughput in Long Term Evolution (LTE) between Single Input Single Output (SISO) and Multiple Input Multiple Output (MIMO). LTE utilizes MIMO data transmission such as Open Loop (OL) Spatial Multiplexing, Close Loop (CL) Spatial Multiplexing, Transmit Diversity and Single Input Multiple Output (SIMO) in achieving higher data throughput and channel capacity as compared to SISO conventional transmission scheme. Based on the results obtained using base station emulator equipment, the performance of physical layer data throughput is evaluated for different conditions and scenarios, which the following are being considered such as various antenna diversity schemes for instance 2x2 antenna configuration, different modulation, coding schemes, bandwidth and resource block. The effect of changing the mentioned parameters will result to a different throughput and impact radio performance. For this, a thorough analysis has been done comparing both cases SISO and MIMO using a commercial LTE device which is now available in the market. The performance study and test includes FDD operational mode for uplink and downlink transmission.The data rate of the LTE device under test has been specified to achieve the LTE target throughput. MIMO open loop and close loop spatial multiplexing provide the highest throughput as compared to the remaining transmission schemes covered in this thesis. SIMO performs slightly better throughput than transmit diversity.Eventually, the used of base station emulator test equipment simulates the real network environment for which all data throughput is being evaluated.

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