

UNIVERSITI TEKNOLOGI MARA

**PERFORMANCE ANALYSIS OF
RELAY ENHANCED IN LTE -
ADVANCED CELLULAR NETWORK**

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ABSTRACT

The proliferation of wireless technologies in communication industry has influenced people's lifestyle and transformed the way they communicate with each other. The ever growing adoption of the technology also has contributed to an increased demand for consistent service quality and throughput in the wireless broadband networks. This has created new challenges for the service operators to remain responsive with reasonable solution plans whilst still keeping the technological innovation and optimum performance at the forefront. The Third Generation Partnership Program (3 GPP) developed standards and specification for meeting the International Mobile Telecommunications (IMT)-Advanced requirements, among others, to improve spectral efficiency, to attain higher data rate and to help lower network latency. Several "features have been introduced including LTE relaying technology. This idea was not new but it was proposed in Release 10 to improve both coverage and throughput through multi hop communication. Besides, it has been considered as one of feasible solutions for extending the coverage and improving network capacity due to a comparatively low installations and maintenance cost and faster deployment. For this reason, a research study was conducted to evaluate the performance of relay involving four (4) scenarios within the LTE network. These scenarios undergo evaluations with three (3) relay deployment environments to demonstrate their impact on Symbol Error Rate (SER) and Signal to Noise Ratio (SNR). In addition to that, the study examines the impact of relay communication schemes on the net data throughput. The analyses are done using MATLAB simulation incorporating channel model developed by the Wireless World Initiative New Radio Phase 2 (WINNER II). This research has shown improvement in the reception performance by attaining higher data rates with existence of relay than conventional transmission. Indirectly, it has also improved the spectral efficiency gain and quality of service by increasing the handover success rate and reducing transmission interruption.

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"I can no other answer make, but, thanks, and thanks." - William Shakespeare

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