

## ABSTRACT

*Technology network services Long Term Evolution (LTE) users need a high quality network but often users are not served, this is because the locations in the Kopo area are not covered by eNodeB. Locations that not covered by eNodeB usually called bad spot or bad coverage. One of the causes of that location not covered by eNodeB is a lot of high buildings, the power from eNodeB that be through attenuation because of the long distance from user, and geographical structure.*

*To solve this problem, a scheme named heterogeneous network is introduced. Heterogeneous networks (HetNet) are cellular network topologies which applies a small cells in the macro cells. In this research, Heterogeneous Network Planning with Relay Node have been done using Range Expansion in Kopo area.*

*The simulation results from this the final assignment research obtained a good system performance for parameter values which is suitable with standard that has been set by the operator. The RSRP value obtained from the heterogeneous network simulation results is the RSRP parameter value with an average of -84.06 dBm, the SINR parameter value with an average of 9.23 dB, the average value for DL throughput is 24 Mbps, for UL throughput which is 18,7 Mbps, and the number of users who get services reaches 2,627 users, with the number of connected users namely 2,619 (99.7%) users and who has rejection is 8 (0.3%) users. Meanwhile be based from range expansion simulation results shows that from range expansion value, range 0 - 6 dB which is used, then more and more users will served the relay node as serving cells. This result shows that heterogeneous network planning with relay node using range expansion is worth implementing.*

**Keywords: Heterogen Network, Relay Node, Range Expansion.**