

## ABSTRACT

Nowadays the need for communications is increasing rapidly, not only for voice but also for data communications. To fulfill all those needs, communication technologies that are reliable both in quality and speed are needed. But high-speed data is not optimum when use in wireless services in the house or high building. There for another way is needed to keep LTE reliable when use in indoor. Femtocell is the solution of the problem. But femtocell uses the same frequency spectrum as any other broadband services. The more femtocell used in an area, overall networks capacity will be disturbed by co-channel interference.

There are two scenarios that were examined in this final project experiment about femtocell LTE interference. That is between MBS – FUE and FBS – MUE. And then to both scenarios applied FFR method using 4 reuse frequencies, 1 frequency use in center cell and the other 3 is use in the edge cell, where the power transmit of the center cell is greater than edge cell. The using of FFR method is to decrease the interference. Parameter that being use to analyze is SINR value that observed from the user side.

FFR algorithm simulated with Matlab 7.11.0 simulator to determine SINR value and to create Layout Position Model of FBS, MBS, and MUE/FUE. Simulation result shows that FFR method is able to increase SINR value in each scenarios. In Scenario 1 with random distance, where the distance between MBS – FBS is 578.105 meters, the distance between FBS – FUE is 29.2746 meters, and the distance between MBS – FUE is 552.547 meters. SINR value increased by 104.695 dB, that is from 162.372 dB to 287.791 dB. In scenario 2, where the distance between MBS – FBS is 604 meters, the distance between FBS – MUE is 27.7849 meters, and the distance between MBS – MUE is 576.315 meters. SINR value increased by 104.695 dB, that is from 183.032 dB to 287.727 dB. It shows the improvement of quality or the decrease of interference to both Macrocell User and Femtocell User after FFR method being applied.

Keywords: Femtocell, Interference Avoidance, Fractional Frequency Reuse, LTE