

## ABSTRACT

The needs of traffic years by years is increasing by trend of communication that tends to require high data rate. Based on reported data that almost 80% of traffic communication was generated indoor[11]. *Femtocell access point* (FAP) is a right solution because FAP will increase coverage that can't be covered by macrocell and won't load data rate in macrocell. In the other side the operator will less cost to increase system capacity because the FAP is built in end user side and by user self. FAP traffic could be carried on or passed by existing broadband network like DSL or FTTx[20]. However the development of FAP caused common problem for wireless technology, such interference. This interference could come from macrocell neither or other FAP around.

On this Final project was simulated four scenarios. The first is all FAP get all available spectrum and the other three scenario use clustering technique and adaptively subcarrier allocation that depend on interference level is suffered by *femtocell user equipment* (FUE). Clustering is a grouping technique some femtocell to share available resource each other in order to avoid inter-femtocell interferences. The differences between three scenario clustering are lie on SINR threshold that become main parameter in clustering. The values of SINR threshold of three clustering scenarios are 5 dB, 10 dB and 15 dB.

From clustering technique is obtained some results, those are improvement average data rate if compared with first scenario that only reached 3,151 Mbps. The amount of improvement average data rate are 0,67 % , 2,16 % and 10,76 % for scenario 2,3 and 4 respectively. On forth scenario suffered best performance because average SINR reached 23,316 dB that support for 64 QAMmodulation. By clustering technique, even though availability resource that defined by TSR is decrease, but system performance average that felt by FUE is increase. That means mitigation IFI by clustering is really effective without decrease network performance.

**keyword** : IFI, FAP, FUE, clustering, Physical resource block, SINR threshold