

ABSTRACT

Along with the development of telecommunication technology, the users demand for fast data access becomes the priority of telecommunication service providers. To meet these specifications, it required a system that has a high efficiency value with the use of same spectrum. Than the current of communication technology also uses a higher frequency. Where the use of higher frequency will be impacted to the smallest wavelength, so the wavelength will be susceptible to multipath propagation. Therefore it needs a cell that has a transmitter that close enough to the user, one of small cell type is femto cell.

Although femto cell can provide a better quality signal on an indoor communication, but as in other communication network femto cell cannot be separated from the main problem of communication network that is interference. Many methods have been proposed to overcome the interference such as SFR (Soft Frequency Reuse) and ASFR (Adaptive Soft Frequency Reuse). The difference between these two methods is on the resource allocation of SFR methods, the number of subcarriers and the power of subcarriers have been set fixed from the beginning of the planning system, while on the ASFR method the number of subcarriers and the power of subcarriers is allocated dynamically based on traffic load system.

In this simulation, used two scenarios test on femto cell in the form of subcarriers set and power selection that will be used. From the result of the simulation obtained the highest value of throughput, energy efficiency, and spectral efficiency on scenario 2 using both ASFR and SFR algorithm. In the use of ASFR algorithm, there is an increase of average throughput value of femto user in each macro cell are 2,50%, $1,9 \times 10^{-6}\%$, and 10,29% over scenario 2 SFR.

Keywords: *interference management, Adaptive Soft Frequency Reuse, macro-femto cell.*