ANALYSIS AND SIMULATION OF SELF-CONFIGURING FRACTIONAL FREQUENCY REUSE (SCFFR) INTERFERENCE MITIGATION METHOD IN LTE FEMTOCELL RADIO PLANNING

UNDERGRADUATE THESIS

By:

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INFORMATION TECHNOLOGY STUDY PROGRAM

FACULTY OF ENGINEERING AND COMPUTER SCIENCE

UNIVERSITAS BAKRIE

JAKARTA

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As a partial fulfillment of the requirements for Undergraduate Degree in

Information Technology at Universitas Bakrie

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This undergraduate thesis is my original work and all information contained in this project paper which is derived from the work of others had been given an award by citing the name of the source's author correctly. All the contents of this undergraduate thesis are the responsibility of the author thoroughly.

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Jakarta, August 2014

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ANALYSIS AND SIMULATION OF SELF-CONFIGURING FRACTIONAL REQUENCY REUSE (SCFFR) INTERFERENCE MITIGATION METHOD IN LTE FEMTOCELL RADIO PLANNING

Hesty Dwi Utami[1]

ABSTRACT

Femtocell is a promising choice for cellular subscribers that able to increase network capacity and QoS (Quality of Service). However, in big scale, femtocell poses a serious interference issue whether it is co-tier interference due to overlapping cause by the neighboring femtocells or cross-tier interference due to the macrocell coverage interference. Self-configuring fractional frequency reuse (SCFFR) method can be one of the option for mitigating interference. The SCFFR is able to maximize the user satisfaction by allocating the frequency in a fair way so that the user can experience the similar throughput. The calculation is based on the parameter of power, SINR, cell throughput and user metric as a custom value to calculate the user satisfaction. The Fractional Frequency Reuse (FFR) also maximize the SINR in the femtocell deployment inside macrocell coverage where the interference only exists on the inner/outer borderline and the femtocells range overlaps the neighboring area. The research is simulated with WinProp Suite as the radio planning simulator and MATLAB for analytical tools.

Index Terms — SINR, throughput, user satisfaction, interference mitigation, femtocell, macrocell, WinProp, MATLAB

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