ABSTRACT

Since introduction commercially in 2009, 4G LTE has growing rapidly in terms of data rates and the application of spectrum flexibility. 4.5G LTE-Advanced networks release 13 support multi-Gbit / s peak data rates improvements in antenna technology, multisite coordination and spectrum flexibility. One of the feature that is increasing data rate use Carrier Aggregation technique in 4.5G LTE-Advanced technology. In this research, the simulation using Atoll 3.3.2 software and analyze about comparison FDD and TDD performance at 4.5G LTE-Advanced release 13 in Purwokerto city. In this simulating 4.5G LTE-Advanced network, only simulations are performed and analyzed the parameters specified in two scenario on FDD and TDD. Frequency used is referring to operator x in Indonesia band 3 1800 MHz FDD and use band 39 1900 MHz TDD which not applied operator in Indonesia. The research analyzed LTE release 13 which has additional features of MIMO 8x8 support, 256 QAM, with setting up to 3 layer Carrier Aggregation (3 CA) using CADS 1 (Carrier Aggregation Deployment Scenario) with total bandwidth 50 MHz. Parameters this research used RSRP (reference signal received power), SINR (signal to interference and noise ratio), and throughput. The result simulation scenario 1 FDD RSRP is -71,41 dBm, where in the scenario 2 TDD shows -71,99 dBm. The result SINR of scenario 1 FDD shows 4.61 dB. In scenario 2 TDD SINR result is 0.56 dB. The result throughput streaming media service Youtube FDD got result for max throughput demand (DL) equal to 105.87 Mbps. The throughput Youtube TDD streaming media results for max throughput demand (DL) of 375.16 kbps. The conclusion of this research, LTE-Advanced 1800 MHz FDD is best applied in Purwokerto city because, the result is much better than LTE-Advanced 1900 MHz TDD performance.

Keywords: 4.5G LTE-Advanced, FDD, TDD, Carrier Aggregation.