ABSTRACT

Radio over Fiber (RoF) is a radio signal delivery through an optical fiber cable. While the Pico Cell is the smallest coverage area of the mobile system so it can be used to increase network capacity. In addition to having a high bit rate, RoF also has a large capacity that makes this network good for use on the user's dense areas.

Long Term Evolution (LTE) is a mobile technology that requires high speed and great capacity, but the use of copper wires on LTE leads to a limited maximum data rate. Thus, to increase the maximum data rate the required replacement of copper wires using fiber optic because it has a higher data rate and greater capacity than copper wires.

The analysis was conducted on the downstream side at 10Gbps bit rate with Non Return to Zero (NRZ) and Return to Zero (RZ) line coding and Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), and Phase Shift Keying (PSK) modulation varies techniques. The radio signal uses the LiNb03 Mach Zehnder Modulator (LiNb03-MZM) with a variation scheme of transmission distance link System 10 to 20 Km with spacing as far as 1 Km.

Simulated results of this study gained the best performance with different modulation techniques. Obtained the best value of power performance is-7.967 dBm for a distance of 10 km. Q-Factor 27.867 for 10km distance using RZ-PSK with BER of 3.33 × 10-169.

Keywords: *Radio over Fiber*, LTE, *Pico Cell*