ABSTRACT

A wireless communication system that provides very high capacity of communication channel is Local Multipoint Distribution Service (LMDS). LMDS operated at frequencies 28 up to 31 GHz allows broadband communication system. However, its propagation characteristic which is using high frequencies is very sensitive of attenuation, especially rain attenuation. Thus, its area coverage is very limited only in 3 km up to 5 km. Besides attenuation, LMDS communication system is also influenced by interferences of other Base Stations.

This research has purposes to reduce the influences of interferences and rain attenuation from LMDS communication system using adaptive MQAM and Equal Gain Combining (EGC) diversity. The result of the research shows that adaptive MQAM and equal gain combining diversity give a value of link availability of the system about 99.99% on observation of maximum BER $10^{-6}$ where the subscriber is in 1 kilometer from the main Base Station. This result is for the case using adaptive modulation system, non adaptive 4-QAM, and non adaptive 16-QAM system. According to the observation of maximum BER $10^{-11}$, the 99.99% value of link availability of the system is obtained where the subscriber is in 1 kilometer from the main Base Station using adaptive modulation system and non adaptive 4-QAM. In the other sides, maximum bandwidth efficiency is obtained for the observation of maximum BER $10^{-6}$ and $10^{-11}$ about 5.9539 bps/Hz dan 5.9084 bps/Hz.

Keywords: LMDS, MQAM Modulation, Equal Gain Combining Diversity and Rain Attenuation