

ABSTRACT

The development of communication services in remote rural areas is quite difficult to do using cable-based systems such as DSL (Digital Subscriber Line) and FTTx. One solution to deal with this problem is to use a wireless system such as radio communication. The FSO (Free Space Optic) communication system is a better choice than radio communication because of the flexibility of frequency use. One of the problems with the FSO communication system is that the distance is not too far away. FSO coverage can be increased by the space diversity method. In this study we will compare the FSO system that does not use space diversity and the FSO system that uses space diversity in three weather conditions namely sunny, rainy and fog. In taking data results using three propagation models namely Isaac model, Kim model and Kruse model with variations in the distance between 100 - 2000 meters. The modulation used in this study is external modulation and direct modulation. The results of the analysis of the performance of the FSO after adding space diversity, the range increases by 1200 meters with external modulation, while for direct modulation it increases by 1000 meters in clear conditions. When the haze conditions with external modulation the distance increases as far as 800 meters, while with direct modulation the distance increases as far as 700 meters. During fog conditions, the range will increase by 300 meters using external modulation and direct modulation. External modulation is better than direct modulation because it can increase the range distance even more than using direct modulation. By adding space diversity, the Q-factor value increases and decreases the BER value and the jitter value.

Keyword : *FSO, Space diversity, weather condition*