

## ABSTRACT

Current advancement of information technology leads to much more usage of communication frequency. C-Band frequency is no longer sufficient to fulfill future needs of telecommunication. Alternative solution for this problem is to use much higher frequency than C-Band which is Ka-Band frequency. KA-Band frequency is used in one of orbit system, LEO (Low Earth Orbit). LEO system is using lower orbit (500-2000 km) which leads to smaller delay of transmission in comparison to others.

Meanwhile, CDMA system has two alternative techniques of modulation. First one is DS-CDMA, which is modulation system for multi access of CDMA. In DS-CDMA system, interference, multipath, and jamming will automatically spread while doing correlation process (code multiplying process). The second one is FH-CDMA system which uses frequency synthesizer method. This method will be controlled by its own code generator.

System performance analyzing process can be considered in two separate parameter, SNR (Signal to Noise Ratio) and BER (Bit Error Rate). Examined the simulation results, we can see higher K factor gains higher system performance. System performance for both DS-CDMA and FH-CDMA has the same K factor, which is K=30. From that K factor, we get  $\pm 0.2$  dB correction of system performance. It's better than when K factor = 28. Hence, the statement of K=30 is the best for this simulation is proven. More, AWGN channel is the best for channel usage in satellite communication system, whether it is DS-CDMA or FH-CDMA. Later, the more frequency carrier will result in decrease of system performance. In rician channel, Doppler shift control this phenomenon. While in AWGN channel, it will be controlled by free space loss.

**Keywords** : LEO (Low Earth Orbit), DS-CDMA, FH-CDMA, BER (Bit Error Rate), SNR (Signal to Noise Ratio), frequency carrier, rician, AWGN