

## ABSTRACT

The vast enhancement of telecommunication technology has encourage the increase of demand for more satellite capacity. HTS in Ka-band frequency that can deliver more capacity up to 50 GHz, can be a solution. Unfortunately Ka-band is susceptible to rain attenuation which potentially difficult to be implemented in Indonesia with has high rain rate. But according to previous research by Suwadi, Maruddani and Lye, combination of coding and modulation technique can be used as a solution to improve the performance of service dealing with rain attenuation

In this research, the writer will try to improve whether the combination of coding and modulation also able to improve HTS Ka-band communication link here in Indonesia with high rain rate per year and to determine threshold of which combination of coding and modulation that best suited to each weather condition, in order to get minimum required performance with  $BER_{min} = 10^{-8}$ .

The conclusion of this thesis shows that the quality of HTS in Ka-band frequency in Indonesia with  $BER=10^{-8}$  can be improved by using QPSK, 8-APSK, 16-APSK and 9 type of FEC. Furthermore The 17 pairs of ModCod can be categorized into 8 thresholds that will determine which ModCod that should be used in order to get link quality of  $BER = 10^{-8}$  for each certain rain condition.