ABSTRACT

HAPS technology has some strength which covers up the weaknesses of both terrestrial and satellite technology. High Altitude Platform Station gives benefit by providing the accepted Line Of Sight (LOS) signal. In real condition in the field, the power accepted is the combination of dominant signal power/LOS and multipath signal power. A parameter which shows the comparison of dominant signal po wer and multipath signal power is called as K factor. The combination of MIMO and OFDM with HAPS channel is expected to give a communication system with larger capacity and less error detected.

This research analyzes the performance of MIMO STBC 2 x 2 and OFDM in HAPS channel 2.4 GHz. The system analyzed is limited in Rician fading channel in which the correlation between antennas is uncorrelated. This research is done based on the increasing of elevation angle between HAPS platform and user terminal which causes the increasing of K factor value and influences the performance of OFDM system affected by multipath fading.

In HAPS system, K factor value greatly affects the performance; the more K factor increases (when elevation angle is getting larger), the be tter performance of the system is. In elevation angle 10^0 – 40^0, the performance of the system is not totally different; but after the angle 50^0 gets an increasing performance significantly up to the angle 90^0 (kf=16.8), the performance gets close to the awgn condition as it is dominated by Line Of Sight (LOS) signal, in which BER 10^{-4} is achieved at SNR 18 dB.

Keyword: HAPS, OFDM, dominant signal/LOS, multipath signal, *K factor*, *elevation angle*, MIMO STBC, *Rician channel*.