

ABSTRACT

Industrial, Scientific, and Medical band (ISM Band) located in 2.402 – 2.480 GHz is mostly utilized spread spectrum technique. Spread spectrum types that is commonly used are Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS). Those methods are used to deal with bad channel occurrence that is caused by not only channel fluctuation but also other systems interferences. Communication among interrupted systems on ISM band are not allowed when using non collaborative coexistence mechanism. One of the method is Adaptive Frequency Hopping (AFH) as FHSS modification. AFH adaptability makes system abandon interrupted carrier frequency and move to another frequency that is expected could improve the performance and throughput on dealing with bad channel.

This final assignment has been simulated non collaborative coexistence mechanism adaptive frequency hopping implementation on ISM frequency system that is equipped by Hybrid ARQ – FEC selective repeat as a packet retransmission technique on data rate 64 Kbps, 384 Kbps, and 2 Mbps. Intruder systems are WiFi, Bluetooth, and Cordless Device. This research compares the Adaptive Frequency Hopping (AFH) and Fixed Frequency Hopping (FFH) system performance in terms of blocking probability and queuing size for each traffic observation. The system has been simulated on AWGN and Rayleigh multipath fading channel using Matlab 7 software.

Simulation result shows that non collaborative coexistence mechanism adaptive frequency hopping implementation is more effective compared to fixed frequency hopping in terms of reducing queuing size and blocking probability. AFH system reduces queuing size so the system only uses $\approx 1/6 - 1/3$ buffer capacity on 1 Erlang traffic. AFH ability could decreases blocking probability up to $\approx 0.1 - 0.2$ atau $\approx 10\% - 20\%$ on 2 Erlang traffic.