

ABSTRACT

Cognitive radio is one of the technologies that is used for solving the problems about spectrum congestion. Cognitive radio technology promises that spectrum allocation will be more efficient, because the data is transmitted in unused frequency after scavenging the spectrum. Beside, it can be used for avoiding interference or jammers.

The inherent spectrum scavenging property of TDCS makes it ideal cognitive radio candidate. On this final project, designed algorithm for TDCS was simulated to show weather it qualified or not for two from three cognitive radio's criterions, which are:

1. Radio-scene analysis.
2. Channel identification.

The output from designed TDCS was information about channel classification and knowing which channel belongs to *idle* or which channel belongs to low-interference and also information about power distribution for each channel. Those information become input for the third criterion of cognitive radio which are ATPC and DSM. The threshold used for idle channel is $INR_{AWGN} = 0.8$ dB and threshold used for low-interference channel is $SIR \geq 10$ dB. The 10 dB threshold is chosen that is referred from the performance of TDCS over AWGN channel, it is showed that $BER = 10^{-3}$ (QOS of voice) was achieved at value 10 dB of SNR.

There is differences with fundamental TDCS that makes trade off on autocorrelation function of its FMW, the value of standard deviation of auto correlation function for fundamental TDCS is 0.04 meanwhile designed TDCS has value 0.2097 at $N = 512$. By adding number of point (N), better auto correlation function was achieved, at $N = 4096$ standard deviation has value 0.0868. The cross-correlation function from both system has the same characteristic, at $\tau = 0$ the value approximate to zero which mean orthogonal.