ABSTRACT

One of the rapidly growing communications systems today is a wireless communication system, but in fact the availability of frequency spectrum is very limited, these limitations needs a new managements for a better regulations of frequency spectrum. and to answer that problem then developed a new technology that is Cognitive radio . The method has already been developed such as energy detector there are still shortcomings, these methods are not robust/sensitive to uncertainties of power noise and can not work optimally when the transmitted signal has a low SNR. then formed a new method is more robust against noise power uncertainty and can work more optimally even with lower SNR namely Locally Optimum Detection.

In this research, conducted the analysis by comparing the performance of Locally Optimum Detection method performance. and Energy Detector. the test is made with two main scenarios are based on the noise power is known and is based on the uncertainty of power noise, each scenario also performed some testing analysis parameters of the comparison of both methods, such as doing a comparison by looking at the influence of SNR against Probablity of Detection, two methods compared to the way generate the same signal, which has the same SNR and noise power.

The results of this research, the performance of local optimum detection method is better than energy detector in all scenarios tested. on testing with the input parameters such as PFA 0.3 and -15 dB SNR, the method LOD produce Pd values of 89,48% and 80,73% for ED method, whereas the SNR versus Pm testing, showed that when the SNR is greater than -6 dB, the method LOD had no errors in signal detection, While ED was still have errors in signal detection of up to 4-dB SNR. And on testing to see the number of samples of data required to achieve the best conditions, where the best conditions are Pd value of 1 and Pm by 0 LOD method only requires 1000 samples of data, while the ED requires 1600 sample data.

Keywords: *Cognitive Radio, Spectrum Sensing, Locally Optimum Detection, Energy Detection*