

## ABSTRACT

Many detectors that can be implemented on radar include Gaussian detectors, Laplacian detectors and locally optimum (LO) detectors. Each detector has its advantages depending on the type of noise and signal to noise ratio (SNR) conditions. The purpose of this study is to see the level of optimization and resistance to noise uncertainty at each detector and the effect of the number of pulses indicated by the value of probability detection (PD). This research uses Gaussian noise and Laplacian noise in the form of simulation. Generating large signal amplitudes using the Swerling 0 model, which means the target does not fluctuate.

In this study, an analysis is carried out on each detector by testing the level of optimization and resistance to noise uncertainty in each detector with the current conditions of Gaussian noise and Laplacian noise in a software simulation. So the writer can analyze the performance of the detector and draw conclusions from the results released by the simulation.

The results of this study were obtained that from a number of scenarios tested, in testing the noise with a threshold of distributed Gaussian and Laplacian noise, probability of false alarm (PFA) generated Laplacian 0.0048 and Gaussian  $5.2 \times 10^{-4}$ . Laplacian detectors will be optimal when the threshold and noises are distributed. Laplacian as well as Gaussian detectors will be optimal also when the threshold and noises are Gaussian distributed. When the threshold design is based on each detector but the noise is different, Laplacian is more robust than the other detectors. In scenarios with parameters PFA 0.1 and SNR -5 dB, all detectors increase in PD each added pulse. LO detectors are better at detecting target signals when SNR is low than with Laplacian detectors that are weak against SNR uncertainty.

**Keywords :** Gaussian Detector, Laplacian Detector, Locally Optimum Detector  
Signal to Noise Ratio