ABSTRACT

A weather radar is expected to provide information about weather conditions in real time and valid. To obtain these results, weather radar takes a lot of data samples, so a large amount of data is obtained. Therefore, the weather radar equipment must provide bandwidth for a large capacity for transmission and storage media. To reduce the burden of data volume by performing compression techniques at the time of data acquisition. Compressive Sampling (CS) is a new data acquisition method that allows the sampling and compression processes to be carried out simultaneously to speed up computing time, reduce bandwidth when passed on transmission media, and save storage media.

There are three stages in the Compressive Sampling (CS) method, namely: sparsity transformation using the Discrete Cosine Transform (DCT) algorithm, sampling using a measurement matrix, and reconstruction using the Orthogonal Matching Pursuit (OMP) algorithm. The sparsity transformation aims to convert the representation of the radar signal into a sparse form. Sampling is used to extract important information from the radar signal, and reconstruction is used to get the radar signal back. The data used in this study is the real data of the IDRA beat signal.

Based on the CS simulation that has been done, it can be seen that the best PSNR and RMSE values are obtained when using a CR value of two times, while the shortest computation time is obtained when using a CR value of 32 times. CS simulation in a sector via DCT using the CR value two times produces a PSNR value of 20.838 dB and an RMSE value of 0.091. CS simulation in a sector via DCT using the CR value 32 times requires a computation time of 10.574 seconds.

Keywords: *Compressive Sampling, DCT, OMP, weather radar.*