ABSTRACT

The development of automation technology is currently very fast and helps human work, one of which is used by the Badan Meteorologi, Klimatologi dan Geofisika (BMKG) *to detect earthquakes. Automatic First Arrival Picking is a system that can detect primary waves at the first arrival or P-Wave that occurs in an earthquake seismic signal. This study aims to create an Automatic First Arrival Picking system and test the performance of the Logistic Regression method to classify this Automatic First Arrival Picking system in detecting primary waves at the first arrival or P-Wave.*

In this Automatic First Arrival Picking study, data samples taken on the IRIS *(Incorporated Research Institutions for Seismology) website with 100 earthquake events taken from the three closest stations with 5-8 MW. Data samples will be processed using four Feature Extraction: Recursive STA / LTA, Classic STA / LTA, Carl STA / LTA and Delayed STA / LTA. Furthermore, the results of Feature Extraction that will be used as a dataset will be classified by the Logistic Regression method.*

From the test results of the Automatic First Arrival Picking system it is known that several parameters can produce the best system performance, that is 50 seconds for time windowing, 55%: 45% for a ratio training and testing, and a value of 100 for Invers of Regularization. The results of the research conducted using the Logistic Regression method to detect P-waves in the Automatic First Arrival Picking system with a calibration scheme that carried out that obtained accuracy of 83%, Precision by 75%, Recall of 64% and F1-Score of 67%.

Key Word: *Automatic First Arrival Picking, Accuracy, Logistic Regression, P-Wave, Seismic Signal.*