

ABSTRACT

Earthquakes are events of vibration or shaking that occur on the surface of the Earth due to the energy release or movement of the Earth's crust (earth plate) from the sudden that creates seismic waves. Earthquakes generally produce P waves, S waves and surface waves. P Wave has smaller amplitude and high speed compared to S wave and surface wave. To perform Earthquake Early Warning (EEW), the magnitude should be estimated early so that warnings can be issued prior to the arrival of the S wave and more damaging surface waves. The purpose of this research is to produce an estimated magnitude of earthquakes from a seismic signal using a method of regression polynomials and to know the performance produced.

The Dataset used is a wave seismic signal of P. P-Wave seismic signal through the feature extraction process, then the resulting value of the feature that becomes the input data to enter into the calculation method of polynomials regression. Afterwards, polynomial regression method performs testing with testing schemes to produce an estimated value of the earthquake magnitude with the best MSE (Mean Square Error) performance.

The Parameter of the test scheme on the estimation system of the earthquake magnitude after the extraction stage of features and estimation using polynomial regression will result in performance. The best performance of the earthquake magnitude estimation system was obtained by 11 values of the extraction result of the feature, data partition 70%: 30%, using the degree variable regression degree polynomials 2 and without doing normalization with the result of the performance of the value of MSE 0.53557.

Keywords: *Magnitude, Earthquake, Seismic Signal, P Wave, Polynomial Regression.*