ABSTRACT

Ionospheric scintillation is a problem that interferes with radio frequencies transmitted by GNSS (Global Navigation Satellite System) satellites. The role of GNSS satellites can provide various kinds of data information and get data easily such as position information. As a result of the scintillation of the GNSS satellite, it becomes unstable and information is not conveyed. The ionospheric scintillation factor which is influenced by velocity (v), solar activity (F10.7), geomagnetic activity (Kp), velocity factor is the most dominant component, the greater v the greater the chance of ionospheric scintillation.

This final project research is modeling to predict the occurrence of ionospheric scintillation at any time after sunset. This study uses logistic regression to model the occurrence of ionospheric scintillation. The data of 427 points on each parameter was partitioned 70% for training data and 30% for logistic data test used. This method is done by combining various predictors into the test, the parameters are entered into the modeling to find theta, then use the theta value into the sigmoid function formulation. The results of the sigmoid function are used to make predictions and calculate the accuracy of all data where prediction errors occur.

From the results of the logistic regression model training using the parameter v as input, the accuracy of the results is 84.3750%, the combination of v and F10.7 gets the accuracy of the results 84.3750%. The combination of v and Kp obtains an accuracy of 82.0313%. The best combination of training and validation results is solar speed and activity. Accuracy values including consistent do not have a significant difference. The implications of the research when the new input combination can be stable when combined with speed, but if with parameters other than speed, the results can vary.

Keywords : Ionospheric Scintillation, F10.7 Index, Kp Index, Scintillation Speed, Logistic Regression