

ABSTRACT

To achieve a stable exchange of satellite information to transmit a signal, however sophisticated the technology that humans have created, there must be something that interferes with these activities. One of the disturbances that are usually experienced by satellites is a natural phenomenon, namely Ionospheric Scintillation, because this phenomenon can interfere with the frequency of radio waves transmitted by GNSS satellites. The Global Navigation Satellite System (GNSS) plays a role in determining the GPS position. The ionospheric scintillation phenomenon is one that can interfere with signals from satellites, GPS will experience rapid fluctuations in the amplitude and phase of the signal when received at the receiver due to electron density irregularities, so that the GPS receiver cannot receive accurate information.

The factors for the occurrence of ionospheric scintillation are influenced by the velocity of the ionosphere layer in the afternoon (v), solar activity (F10.7), and *geomagnetic* activity (Kp). Parameter factor v is the most dominant component for causing ionospheric scintillation, the greater v the greater the chance of ionospheric scintillation. The parameter factor F10.7, the greater F10.7, the higher the chance of ionospheric scintillation. This thesis requires a simple but accurate modeling in predicting the occurrence of the ionospheric scintillation phenomenon which often occurs after sunset. This study uses a neural network (NN) method to build a modeling of ionospheric scintillation events. The NN model in this study was built using 427 data points for each parameter. 70% of the 427 data points are used for training data (training set). The remaining 30% is used to validate the NN model that has been built.

The results of the training, the NN model in this study using only parameter v as an input feature gets an accuracy of 78%, the combination of v and F10.7 has an accuracy of 80%, the combination of v and Kp gets an accuracy of 79%, and the combination of the three parameters (v , F10.7, and Kp) had 81% accuracy in predicting whether or not ionospheric scintillation occurred. From the test results, the NN model with the input feature v can achieve 84% accuracy, the combination of v and F10.7 gets 80% test accuracy, the combination of Kp and v gets 82% accuracy, and the combination of the three test parameters gets 85% accuracy. The results of all combinations used if the results of the accuracy of the training data and test data do not have a large enough distance then the combination can be said to be stable, but if the results of all combinations have stable conditions, the results of the highest accuracy are taken.

Kata Kunci: F10.7, Geomagnetic Activity, Ionospheric Scintillation, Neural Network, Predict, Scintillation Velocity.