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ニューラルネットワークを用いた太陽風入力による東京上空 foF2 の擾乱予測
Prediction of foF2 variation above Tokyo using solar wind input to a neural network

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Neural network has the ability to learn the empirical relation from input data. It is often used to produce empirical prediction models of several space environmental parameters. One operational model (Nakamura, 2008) used K-index input to predict foF2 variations and ionosphere storms above Tokyo. There are also several works for predicting geomagnetic indices such as Dst from the solar wind inputs (e.g., Watanabe et al., 2002). These studies lead us to expect that the prediction of foF2 at the disturbed situation can be more accurate when solar wind parameters are used to the inputs. Recently the availability of solar wind parameters from the Advanced Composition Explorer became longer enough to overlap one solar activity. In this study, solar wind proton velocity and IMF-By, IMF-Bz are used to the input to predict the foF2 disturbances above Tokyo. The K-index input model (Nakamura, 2008) was also recreated using the same data term as the SW input model. The SW input model tends to predict more often the negative disturbance cases, and it predicted daytime quick variations more accurate than the K-index input model. Statistical comparison of the predicting ability of those 2 models will be discussed, and the contribution of the solar wind input parameters to the foF2 will be tested using an artificial input.
Keywords: ionosphere, foF2, prediction, neural network, solar wind