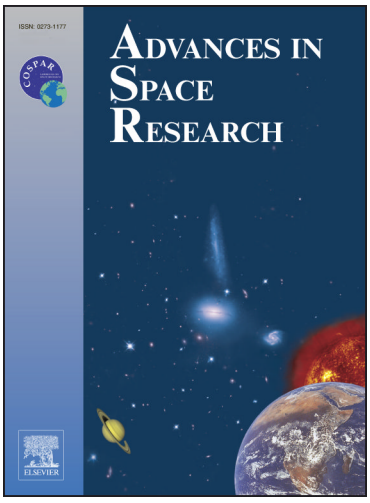

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Predicting TEC in China Based on the Neural Networks Optimized by Genetic Algorithm

Rui Song [a], Xuemin Zhang [a, *], Chen Zhou [b], Jing Liu [a], Jianhui He [c]

[a] *Institute of Earthquake Forecasting, China Earthquake Administration, Beijing, China*

[b] *School of Electronic Information, Wuhan University, Wuhan, Hubei, China*

[c] *Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China*

Abstract

This paper illustrates the application of neural networks (NN) in developing a regional prediction model for the ionospheric total electron content (TEC) over China. To avoid the 'local minimum' effect caused by the traditional NN-based model, genetic algorithm (GA) is utilized to optimize the initial weights of NN. In this study, the NN has 19 input parameters which are known to cause variations in the ionospheric parameters. These parameters relate to the ionospheric diurnal variations, seasonal information, solar cycle, geomagnetic activities, geographic coordinates, and declination. The output parameter is the daily hourly vertical TEC (VTEC) measured from 43 permanent GPS