Neural network based nonlinear determination of the AE index

D. Jankovičová, P. Dolinský, F. Valach, Z. Vörös
Hurbanovo GO, Geophysical Institute of Slovak Academy of Sciences[1]

A b s t r a c t : The auroral electrojet index (AE) was introduced in 1966 to describe the global activity of the auroral zone electric currents using the information from 12 stations which are located almost evenly around the northern magnetic pole of the Earth. Missing data deteriorate the determination of the AE index. To ensure the proper determination of the auroral electric currents activity during the periods when some of those observatories might have data gaps we use the powerful nonlinear technique of neural networks for AE index reconstruction and prediction. The results show that a consideration of local singularity characteristics of time series improves the prediction of sudden intermittent changes in data.

Key words: magnetosphere, the auroral electrojets, nonlinear modeling

[1] 947 01 Hurbanovo, Slovak Republic, e-mail: geomag@geomag.sk