

Neural network model for Kp prediction based on one-hour averages of solar wind data

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Abstract: In the paper a new neural network (NN) model for prediction of Kp indices during geomagnetic storms is proposed. The model consists of 34 individually trained three-layer networks that are fed with solar wind parameters B_z , n , and V measured at libration point L1. One-hour averages of those are used. Four geomagnetic storm intervals (14–18 May 1997, 1–7 May 1998, 25–26 June 1998, and 24–27 September 1998) were used for the training and validation of the NNs. The final test was performed on three storm intervals (26–29 August 1998, 18–22 October 1998, and 7–11 November 2004). This test was compared with the results of simple NNs fed with three-hour averages of the solar wind data. As follows from this comparison, the NN model based on the one-hour averages gives more accurate predictions of Kp during the selected test storms, than the usually utilized model based on three-hour averages of solar wind parameters.

Key words: neural networks, Kp index, geomagnetic storm, solar wind

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