

NONLINEAR DYNAMICS AND PREDICTION FOR SPACE WEATHER

*O. Cheremnykh, V. Yatsenko, O. Semeniv,
Iu. Shatokhina*

Space Research Institute, NAS and NSA of Ukraine
(40, Academician Glushkov Ave., Kyiv 03680, Ukraine;
e-mail: vyatsenko@gmail.com)

S u m m a r y

We consider the problem of space weather modeling and prediction. It is suggested to utilize the nonlinear noisy black-box model to predict the Dst index. We assume the presence of a weak turbulence for the magnetosphere plasma. It is suggested to consider the solar wind parameter VB_z (a product of the solar wind speed on the south magnetic field component) as the input information for a discretized black-box model. The data on the Dst index were chosen to be the output information similarly to that for the processes of magnetospheric dynamics responsible for the Dst storms. It is shown that the relationship between VB_z input and the Dst output can be represented by a nonlinear discrete model. This model is compared to the previously developed prediction model suggested by Balikhin et al. While the both models demonstrate a high level of prediction efficacy, their lack of the sensitivity to the solar wind dynamic pressure requires their further improvement.