

Evaluation of Relativistic Electron Flux Forecast at GEO Satellite

NAGATSUMA, Tsutomu^{1*} ; SAKAGUCHI, Kaori¹ ; SAITO, Shinji² ; MIYOSHI, Yoshizumi² ; SEKI, Kanako²

¹National Institute of Information and Communications Technology, ²Solar Terrestrial Environment Laboratory, Nagoya University

We have developed near real time prediction model for relativistic electron flux at GEO satellite. This model is based on a multivariate autoregressive model with using solar wind speed, north-south component of the magnetic field and dynamic pressure as inputs. Detailed description of this model can be found in Sakaguchi et al. [2013]. We have started relativistic electron flux forecast service as a test product since Apr. 2013. Forecast information can be found in the following web pages (URL: <http://seg-web.nict.go.jp/radi/>).

There are several difficulties in operating a near-real time forecast model. One is the quality of the real-time solar wind data. Because quality of real-time solar wind density data is quite poor, we avoid using solar wind density data for our operational model. The other one is the lead-time of the solar wind data. Currently, we can use only ACE data for solar wind input. The lead-time of this data is only about one hour. Therefore, we also 'predict' solar wind condition for two or three days in advance from current solar wind information. Anyway, prediction efficiencies of our forecast for 1day, 2day, and 3day ahead in 2013 are 81%, 63%, 48%, respectively. Evaluation and future perspective of our forecasting model will be introduced in our presentation.

Reference:

Sakaguchi, K., Y. Miyoshi, S. Saito, T. Nagatsuma, K. Seki and K. T. Murata (2013), Relativistic electron flux forecast at geostationary orbit using Kalman filter based on multivariate autoregressive model, *Space Weather*, 11, 79-89, doi:10.1002/swe.20020.

Keywords: Space Weather Forecast, Solar Wind - Magnetosphere Interaction, Magnetosphere, Radiation Belt, Inner Magnetosphere, Modeling