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Development of Radiation Belt Prediction Models for Space Weather Forecast

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Dynamic changes of the Earth's Radiation belt is one of the well known but still unsolved issue of solar terrestrial physics.This is also important for the practical point of view because relativistic electron can penetrate into a satellite body and causes deep dielectric charging. This phenomenon is one of the major reasons of satellite anomaly. For prediction of space environment around GEO, we will proceed to develop 1) near real time prediction model of relativistic electron environment, 2) high precision global MHD simulation in this 5-year term from 2011. As for the prediction model of relativistic electron environment, we plan to develop two types of models. One is near real time prediction model based on the AR model that is a kind of the parametric analysis methods for the time-series data. The product of this model is for daily operation of geosynchronous satellite. The other is high time and spatial resolution numerical forecast model based on combination between global MHD simulation code and particle tracing code and others. The product of this model is for post analysis of satellite anomalies. We will introduce an overview and current status of our project.

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