

SUMMARY

Purpose & Contents	Design of the Prediction Model of Earth Radiation Belts' Effects on the Satellites				
Results	<ul style="list-style-type: none"> ○ Development of the Korean earth radiation prediction model and construction of real-time operating system ○ Establishment of a 3D visualization system of DREAM model and providing service to satellites space weather users ○ Construction of customized service using satellite space radiation prediction model including electron, proton, and heavy ions based on SPENVIS ○ Completion of high energy electrons' 3-day forecasting model at geostationary satellites ○ Correlation analysis between satellite anomalies and space weather indices such as Kp, Dst, AE, and electron flux for both geostationary orbit and low-earth orbit 				
Expected Contribution	<ul style="list-style-type: none"> ○ The high-energy electron flux monitoring using the DREAM model can provide the satellite operators and designers with helpful information to protect satellites against the high energy electron flux and related space radiation damage. ○ DREAM has been imported from Los Alamos National Laboratory with the international collaboration. Customized 3D web service using DREAM outputs has provided to several domestic satellite operators such as KT sat, ETRI, KARI, KIOST, and SatReC. This totally new space weather service based on DREAM outputs will be ported to NOAA SWPC. ○ The cumulative radiation dose information and life expectancy information obtained from this project can be used as a practical guideline in the satellite radiation hardening design and electronic parts certification. ○ Our own model of earth radiation belt prediction updated by using recent academic results. This model might be useful for exact post-analysis in case of specific radiation damage occurrence. Based on accumulated knowledge during model development process, it becomes to enable for domestic researchers to collaborate with foreign researchers. 				
Keywords	satellite electron flux	earth radiation belt	space radiation	satellite lifetime	high energy electrons