

SYMPOSIUM ON SAFETY, QUALITY AND KNOWLEDGE MANAGEMENT IN SPACE  
ACTIVITIES (D5)

Space Weather Prediction and Effects on Space Missions (3)

Author: Prof. Takahiro Obara  
Tohoku University, Japan

Mr. Haruhisa Matsumoto  
Japan Aerospace Exploration Agency (JAXA), Japan  
Mr. Kiyokazu koga  
Japan Aerospace Exploration Agency (JAXA), Japan  
Dr. Tateo Goka  
Japan Aerospace Exploration Agency (JAXA), Japan

SPACE ENVIRONMENT MEASUREMENTS BY JAXA SATELLITES AND ISS

**Abstract**

In order to monitor space environment and its temporal variations, JAXA (Japan Aerospace Exploration Agency) Space Environment Group has been conducting space environment measurements for more than 20 years. JAXA installed space radiation detectors, magnetometers and plasma detectors on LEO (Low Earth Orbit) satellites, GEO (Geostationary Orbit) satellites, GTO (Geostationary Transfer Orbit) satellites and JEM (Japanese Experimental Module) of the ISS (International Space Station). With these data, some distinguish achievements on space environment science and technology have been obtained and the assessment of space environment models has been made. Solar proton advanced model has been proposed to ISO (International Standard Organization). Advanced radiation belt model, which accommodates temporal and spatial variations of relativistic electrons in the outer radiation belts, was proposed. Intensity of MeV electrons seems to be controlled by solar wind velocity as well as magnetic activities in the vicinity of GEO altitude. With these relations, we have constructed advanced outer radiation belt model. Transport of MeV electrons into the inner radiation belt was also identified. These electrons penetrate into the inner belt across the slot region during the recovery phase of the very big magnetic storms. These penetrations will be one of the supply processes of MeV electrons in the inner radiation belt. Neutron measurement by ISS/JEM is one of the big achievements and detection of small particles has been detected along the ISS orbit. We are using these space environment data brought by JAXA satellites and ISS/JEM to get situation of space environment in real time, and we sometimes provide warning messages to satellite operator as well as ISS/JEM manager when the space environment will be harmful. In the talk, we will demonstrate current JAXA activities in space environment measurement together with coming projects; i.e. Quasi Zenith Satellite project and international collaboration by means of forging satellites.