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Prediction and measurement of space weather conditions and impacts on space missions (3)

Author: Dr. Hideki Koshiishi
Japan Aerospace Exploration Agency (JAXA), Japan, koshiishi.hideki@jaxa.jp

APPLICATION OF SPACE ENVIRONMENT INFORMATION TO OPERATIONS OF SPACECRAFT AND MANNED SPACE MISSION IN JAPAN AEROSPACE EXPLORATION AGENCY

Abstract

Information on space environment for safety of spacecraft and manned space mission has been gathered and analyzed by the space environment group in the Japan Aerospace Exploration Agency (JAXA) since 1987. Several instruments for in-situ measurements of space environment have been developed and installed to Japanese and French satellites, Space Shuttle flights, and International Space Station, which are particle detector for electrons, protons, heavy ions, and neutrons, magnetometer, atomic oxygen monitor, dosimeter, single event monitor, potential monitor for electrostatic charge and discharge, and space micro debris detector. Information obtained from these instruments has been gathered into the Space Environment and Effects System (SEES) in the JAXA as well as other information obtained from other spacecrafts and ground-based equipments. The SEES has several functions by using these data as follows; (1) to inform real-time information on space environment for operators of spacecraft and manned space mission, (2) to alert space radiation hazard for those operators in case of solar flares, coronal mass ejections, and geomagnetic storms and sub-storms, (3) to provide usual space environment models such as solar, interplanetary, geo-magnetospheric, and cosmic-ray activities for spacecraft engineers, (4) to analyze the gathered data with international scientific researchers for understanding of solar-terrestrial physics as well as for development of more precise space environment models for future space missions. In this presentation, each function of the SEES will be reported.