Space Weather Mission of SmartSat Program

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We are planning to launch a small satellite, called SmartSat. This satellite is being developed under the collaborative program of government agencies (NICT and JAXA), and a private company (Mitsubishi Heavy Industry) in Japan. This program is an orbital demonstration in near earth orbit before the future L5 mission.

We have been studying the L5 mission for space weather research and operational forecasting experiment. The spacecraft will be deployed at the L5 point of the Sun-Earth system for remote sensing of the Sun and the interplanetary space and for in situ measurement of the solar wind plasma and high energy solar particle event. For the L5 mission, NICT and JAXA develop wide field imagers for Coronal Mass Ejection (CME) tracking and advanced high energy particle sensor, and develop mission processor for autonomous identification of space weather events based on the onboard data processing (noise reduction, event detection, tracking, and data compression, etc.).

The space weather experiment of the SmartSat program consists of wide field imager for CME tracking (WCI), space environment data acquisition equipment (SEDA), and mission processor (MP). These instruments will be principal components of the future L5 mission. We hope to launch the SmartSat around 2008.

Since the orbit of SmartSat is geostationary transfer orbit, the particle signature of radiation belt can be monitored. SEDA consists of two-electron sensor and three-ion sensor to measure the wide energy range of particles (electron: 30keV-20MeV proton: 400keV-500MeV). These data will be used for studying the generation and loss process of the radiation belt particles.

Although the main purpose of this program is an orbital demonstration, we expect several space weather studies can be done under this program. We will report instrument design, overview and current project status.