

Development of the ground data processing/calibration system for the plasma wave measurements onboard ERG satellite

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The SPRINT-B/ERG satellite is a Japanese small satellite mission to investigate dynamics of the inner magnetosphere. To achieve comprehensive observations of plasma/particles, fields, and waves, the Plasma Wave Experiment (PWE) is installed onboard the ERG satellite to measure electric field in the frequency range from DC to 10 MHz, and magnetic field in the frequency range from a few Hz to 100 kHz. A variety of operational modes are implemented in the PWE, and the telemetry data consists of several kinds of data such as power spectrum, waveform, spectral matrix and DC E-field. The PWE will generate two kinds of mission data; nominal data and burst data. The former will be generated 24 hours per day as survey data and all data will be downloaded to the ground. On the other hand, the latter are essentially raw waveform data and the data amount is quite huge. They will be once stored in the mission data recorder (MDR) and partial data will be downloaded after data selection. In order to obtain maximum science output, it is very important to check and analyze the nominal data quickly and select valuable data from burst data stored in the MDR. In the present paper, we introduce our data processing plan on the ground to achieve such requirement. The telemetry data from the ERG satellite will be stored in the Level 0 data archive system at ISAS/JAXA. We first divide the raw data into species of data products and convert them into CDF (Common Data Format) files. Those files are called Level 1 and they are non-calibrated data. Secondly we calibrate the Level 1 data and convert them into Level 2 data. As the Level 1 data are also important for quick data survey for selection of burst data, we designed the CDF files for Level 1 to meet the specification of "autoplot" [1], which is an interactive browser for data on the web. By using the function of autoplot, the Level 1 data will be readily surveyed for data selection. We plan to construct the process as an automatic pipeline. We also plan to apply similar pipeline processing to the data measured by the Plasma Wave Instruments (PWI) onboard the BepiColombo/MMO (Mercury Magnetosphere Orbiter). In the presentation, we introduce the current status of our system.

[1] Autoplot interactive browser, <http://autoplot.org/>

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