

ISS/JEM/IMAP-GLIMS の開発

Development of ISS/JEM/IMAP-GLIMS

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IMAP-GLIMS is a shared project between JEM/IMAP and JEM/GLIMS missions, which will be onboard ISS/JEM in 2012 as an instrument package of the JEM/Shared Port Experiment. IMAP-GLIMS/MDP (Mission Data Processor) will be developed jointly by IMAP and GLIMS teams. IMAP-GLIMS/MDP is FPGA based electronics to handle command/telemetry, automatic/autonomous control, power control, science data downlink buffer, and GPSR interface.

ISS instruments in general must be designed failure free, especially for software bug/error and hardware failure, because they may affect the safety of ISS and astronauts. None of ISS, JEM, and Shared Port Experiment (SPE) Bus has automatic sequence control and autonomous features because they are manned and/or tele-science centric design. MDP will have 1- week sequence control capacity and some limited autonomous capability. SPE Bus has limited power control capabilities, thus MDP controls power supply and command/telemetry of 1) GPSR, 2) IMAP/VISI, 3) IMAP/EUVI, and GLIMS/SHU (Science Data Handling Unit). GLIMS/SHU (which is similar to Sprite-sat SHU) controls GLIMS instruments. Downlink capability of ISS is more than 70% duty because of geostationary communication links, but PSE has 25 kbps maximum data rate for 4 experiments. IMAP-GLIMS MDP stores/average IMAP and GLIMS science data, which are mostly acquired during night side of ISS orbit. A GPSR unit also developed to deliver 1 pps signal (1 micro second accuracy).