Flight Software Ground System Impacts
- JAXA's Approach -

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JAXA's Approach

- JAXA is developing a new approach to develop flight software.

- In the past, each piece of flight software was designed almost independently without using any standard or guideline. This prevented reuse of flight software from instrument to instrument and from spacecraft to spacecraft.

- In order promote reuse of flight software, JAXA adopted a model-based approach.

- In this approach, each piece of flight software is designed using the Functional Model of Spacecraft (FMS), developed by JAXA. The design of flight software is stored in a standard database.

- By using this database as a library of flight software, the developer of new flight software can reuse existing software easily.

- We are also developing a tool that generates a code from the contents of the database.

Model-Based Development

Functional Model of Spacecraft (FMS)

Specifies a set of rules to describe the behavior of flight software as functional objects, which is similar to a small subset of UML

Actual Design of Flight Software

Actual design of each piece of flight software, designed as a set of functional objects, each with operations and attributes, according to FMS

Spacecraft Information Base (SIB)

Description of functional objects, stored in a standard format as an XML document

Flight Software

Developed either manually or automatically from the description of functional objects

Ground Monitor and Control Software

Monitors and controls any piece of flight software based on the description of the functional objects stored in SIB

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