

Development of Operation Plan and Log Management System for LISM/KAGUYA

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KAGUYA (SELENE) is Japanese lunar explore that launched on Sept. 14, 2007. Its major scientific objective is the Moon's origin and evolution. LISM (Lunar Imager/Spectrometer), an optical instrument on-board KAGUYA, will provide precise and detailed topographic, geologic, and mineralogical information of the moon. During a one-year operation of KAGUYA, LISM will observe the whole surface of the moon systematically. To obtain the systematic global coverage, operation planning should be well organized. Logs of past observations are also stored in a similar way. We develop a database system to manage LISM observation plans and logs to administrate systematic observations. This system store all observation plans and logs into a database. Users can query planned or finished observations from the database, and review footprint locations, observational conditions and other attributes relating those observations.

The observation plans and logs, which are delivered in CSV text tables, are imported into the system. There are about thirty kinds of attributes, for instance, sensor type, observation mode, observation start time, end time, and footprint location. The system stores all attributes in an internal database. PostgreSQL, one of the most common database systems, is adopted for a database engine of the system. Main components and user interface is developed with Java. The system is work as web-based application software on the Apache web-server and the Tomcat Java-Servlet container. A web application is adopted because it is the least platform-dependent. The various technologies of Java development are introduced to reduce development time and warrant the quality. By these technologies, additional development is made efficient. Imported data contains location of LISM observation footprint every one-second. Therefore, the total amount of them for a one-year observation will be huge volume. The system needs quick and easy access to a large database. For that purpose, we introduce a Hibernate framework. We also optimize SQL queries to tune-up the performance.

This system provides functions for managing systematic observations of LISM. Available functions are Login Certification (Session Management), Data Import, Management of Coverage Rate, Search Function, Data Deletion and KML Export. A database system that can manage real observation data of LISM/KAGUYA is developed. With this system, the efficiency of operational administrative of LISM observation improves dramatically, and obtaining the systematic global coverage becomes possible more smoothly. The Coverage Rate manage function and the KML Export Function can visualize administrate works.