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Integrated visualization system of spectral data sets of Kaguya

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Spectral observation had been performed by Multi-band Imager (MI) and Spectral Profiler (SP) onboard the Kaguya. MI mapped lunar surface with nine wavelength bands to obtain multi-spectral images. Although SP is not an image sensor, it has high spectral resolution than MI because it observes continuous reflectance spectra from the lunar surface. Data sets of SP can be used to direct mineralogical discrimination/identification of observation points.

Currently, data analysis for MI and SP are conducted separately, but researchers want to retrieve spectral information for both of data sets efficiently to find relationship between the multi-spectral image and the continuous reflectance spectra. However, there is no systematic tool to fill the requirement.

We developed a web system for overlapping visualization of SP data on MI data to solve this situation. With this system, user can browse a map of MI data, select SP's observation displayed on the map, and gets the continuous reflectance spectra of SP data.

The backbone of this system is map creation and transmission mechanism though web with Web-GIS tools provided from Wise-Caps system developed in the university. It provides a platform for data browsing, sharing and analysis. MI ratio images are applied to the frameworks of Wise-Caps system. For overlapping of SP data on MI ratio image, we created a mechanism to visualize the observation points and plot the continuous reflectance spectra from location information of SP observations and SP data sets with Web-GIS tools and some web-based technologies. As observation points of SP amount to tens of missions, we used RDBMS as backend in the system to handle huge data of SP.

User can know mineral composition from the continuous reflectance spectra on interested location that is represented as geological maps of the lunar surface. Comparison of the continuous reflectance spectra between several locations is also available. We will explain overview of this system architecture and Web-GIS framework to implement this system.

Keywords: Kaguya, GIS, Spectra, Database, Visualization