[EJ] Evening Poster | P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS07]Mars and Mars system: results from a broad spectrum of Mars studies and aspects for future missions

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Unprecedented progress in being made in our understanding of the planet Mars, especially because of new data from the US, European, Russian, and Asian missions to Mars. Eight spacecraft are currently operating at Mars, with six in orbit (Odyssey, MRO, MAVEN, Mars Express, Mangalyaan and TGO) and two on the surface (MSL-Curiosity and MER-Opportunity), the largest number ever at any given time. In addition InSight Lander is on track for launch in 2018, and Mars 2020, ExoMars and the Emirates Mars Mission in 2020. All this is a clear demonstration of public's strong fascination with and commitment to Mars exploration and the resulting scientific bonanza. Synergistic investigations with ongoing or already completed missions along with modeling studies and earth-based observations are gradually revealing the nature of Earth's most closely resembling planet that took on a different evolutionary track. Morphology and variable phenomena seen on the surface (RSLs, for example) indicate the red planet may possibly be still active, and require a clear understanding of its current geologic and atmospheric state, climate evolution and habitability. Thus, this session is planned to discuss recent results from a broad spectrum of Mars studies encompassing the interior, surface, atmosphere, plasma environment, and the Mars system including its two satellites. Abstracts on instrumentation and future mission plans are also encouraged for this session, as both the presenters and the audience would greatly benefit from ensuing discussions and feedbacks.

[PPS07-P04]Construction of CRISM Database for Mars web-GIS

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Many satellites have been launched to Mars and many observation data have been accumulated so far. We can study the surface condition, internal structure and mineral distribution of Mars by analyzing the observation data. Although the data are released online for free, the data web sites are not always well-organized. We need detailed search in those web sites to get the data we want. It takes time to find the data we need. The exact position where the spectral data are observed is often very hard to identify unless accompanying spontaneously observed image data. There is a Mars web site where the link to download each observation data appears on the corresponding location of a map layer. However, the web site does not provide any analysis function. Another web site, on which we can analyze observation data, is too heavy for practical use.

In this study, we build a database for Mars spectral observation data, which constitutes a very important part of the web geographic information system (web-GIS) of Mars which is under development. The efficient management of data becomes possible by introducing the database which is necessary for handling Mars observation data of large variety and amount. In the client side, the user can browse, download and analyze the data simply, easily and quickly.

We install Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) data as source data for the database. CRISM data are 3D image cube data, which include spectral data in each image pixel. We can

identify minerals by examining the absorption bands of the observed spectra. We choose key items from observation data to install in the database. Such key items would be useful for the user to search the data which he/she need for studying mineral compositions on Mars.

We use Post-GIS for developing the CRISM database. Post-GIS is an enhanced version database of PostgreSQL, which is a relational database. We can handle some datatypes including geometry and calculate coordinates by using Post-GIS. We use Python, a programming language to navigate Post-GIS and to install the contents of CRISM data or GIS objects to Post-GIS. The drivers to use Post-GIS on python are easy to handle. In addition, we use mapserver, which is also an open source software, where we can plot observation points and retrieves the information of the exact spots which the user selects.

We build a CRISM database which will improve the efficiency of browsing, downloading and analyzing the Mars spectral data. In the next step, we plan to develop other databases for other kinds of data useful for the 3D visualization in the Mars web-GIS.