PRELIMINARY RESULTS OF THE MULTIBAND IMAGER AND SPECTRAL PROFILER.

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Introduction: The Lunar Imager/SpectroMeter (LISM) is an instrument developed for the SELENE (KAGUYA) mission. SELENE was launched by an H-IIA Launch Vehicle on September 14, 2007. LISM consists of three subsystems, the Terrain Camera (TC), the Multiband Imager (MI), and the Spectral Profiler (SP).

The MI is a high-resolution multiband imaging camera and it acquires push-broom imaging data by using selected lines of area arrays. The spectral band assignments are 415, 750, 900, 950 and 1000 nm for the visible spectrum and 1000, 1050, 1250 and 1550 nm for the near infrared spectrum. The spatial resolution of visible bands is 20 m, and that of near infrared bands is 62 m from the 100 km SELENE orbital altitude. We will observe the global high resolution mineral distribution of the lunar surface in nine band images acquired by MI [1].

The SP is a visible - near infrared spectrometer. SP will obtain continuous reflectance spectra of the lunar surface with broad spectral coverage (500-2600 nm), high spectral resolution (6-8 nm), and high spatial resolution (500 m) [2].

Objectives: One of the important scientific goals of MI and SP is to investigate small but scientifically very important areas such as crater central peaks and crater walls. Investigations of such small areas will help answer current questions such as the existence, chemical composition, and source of olivine at the central peaks of some craters [3].

In-flight performance: MI successfully took its first lunar images on November 3, 2007. To check LISM-MI hardware functions, all possible observation parameters, such as exposure, compression table and nominal/SP support mode, were used and were confirmed to be normal. In-flight performance of SP are now being evaluated using the "first light" data as well as other data acquired during the initial checkout period. "Dark" and its noise level are being investigated for every pixel of three detectors using data acquired during nighttime. So far no new dead/damaged pixels have been found. The radiometric sensitivity and spectral location of each pixel is being monitored using internal calibration lamp data. It is confirmed that overall difference of sensitivity between in-flight and pre-flight data is small. Derived MI images and MI and SP spectra demonstrate advantage of MI's high spatial resolution and SP's high S/N ratio and continuous reflectance spectra to understand surface mineral distribution of the moon. Latest results from our researches will be presented at the conference.

References: [1] Ohtake M. et al. 2008. *Earth Planets Space* 59:1-8. [2] Matsunaga T. et al. 1999. Journal of Remote Sensing Society of Japan 19:152–169. [3] Tompkins S. and Pieters C.M. 1999. *Meteoritics Planet. Sci*, 34, 25–41.