

Operation plan of Lunar Imager/Spectrometer on SELENE

Jun'ichi Haruyama[1]; Tsuneo Matsunaga[2]; Makiko Ohtake[1]; Tomokatsu Morota[3]; Yasuhiro Yokota[1]; Chikatoshi Honda[4]; Haruyama Jun-ichi LISM Working Group[5]

[1] ISAS/JAXA; [2] NIES; [3] JAXA/ISAS; [4] ISAS; [5] -

In this year, the Japanese Moon explorer SELENE will be launched by an H-IIA rocket from the Tanegashima Space Center. The SELENE will carry three optical mission instruments: the Terrain Camera (TC), the Multi-band Imager (MI), and the Spectral Profiler (SP). The TC is a push-broom stereoscopic imager that has forward-looking and aft-looking optical heads with slant angles of +/- 15 degrees from the nadir vector. The MI is also a push-broom imager that has two optical heads for visible wavelength observation in five color bands and for near-infrared observation in four bands. The SP is a Cassgrain line spectral profiler for wavelengths of 520 to 2600nm. These three instruments are called as the Lunar Imager / Spectrometer (LISM), generally. To acquire important data for lunar sciences with making the most of performance of each LISM instrument in the SELENE nominal mission period of one year, we have started to prepare pre-launch operation plans, in detail.

The operation phase of the SELENE mission is divided into four: 1) phasing orbit phase, 2) initial checkout phase, 3) nominal mission phase, and 4) optional mission phase.

The period of phasing orbit phase that is from the launch to the injection into the revolution orbit around the Moon is about one month. In the phasing orbit, most mission instruments including LISM will be, at least once, turned on their main powers and heater control powers for health checks.

In the initial checkout phase, each mission instruments will be allotted three revolutions for its health check, function check, and performance check. Adding to these check items, the LISM team must acquire the data to exam the onboard compression performance. We have already started preparing a command sequence plan for initial check out phase.

During the nominal mission phase of 11 Moon cycles, it will be performed 1) TC stereo-mapping in three Moon cycles, 2) TC mono-telescope mapping under illumination conditions of eastward and westward lower solar elevation angles in two Moon cycles, and 3) MI visible and near-infrared mapping in six Moon cycles. SP will acquire data in the daytime. The detailed moon cycle allotment for TC or MI operation is dependent on the beta angle (Sun - Moon - Spacecraft).

The optional mission will be carried out after the nominal mission phase if the fuel on the SELENE is remained. Some plans have been proposed as the optional mission: an extended period mission with same nominal altitude, a lower altitude mission, and a higher altitude mission with much extended mission period. The detailed optional operation plan is under consideration.

In each mission phase, different operation plans are required. In this presentation, we will introduce LISM pre-launch operation plans.