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The First Global Lunar Topography Mapping by KAGUYA (SELENE) Laser Altimeter (LALT)

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The Laser ALTimeter(LALT) aboard Japanese lunar explorer KAGUYA(SELENE) is a ranging instrument which measures the distance between the satellite and the lunar surface with accuracy of 1 m by detecting the timing delay of the reflected laser light.

As KAGUYA is in a polar orbit, the first global and precise topographic map is expected to be obtained. Especially, data at high latitude regions above 75 degree will be gathered for the first time. LALT data are dedicated to determine the lunar global figure, especially center-of-mass and center-of-figure offset, and to estimate the thickness of the lunar crust in combination with gravity field data obtained by RSAT/VRAD gravity field measurement. It also provides basic information for the exploration of the lunar polar area. Also, intensity of the returned pulses contains information concerning inclination and roughness of the footprints, which will contribute to the study of the lunar surface maturity and age.

The LALT started normal operation on 30th, December 2007 after two months' commissioning phase. Measurement is done with repetition rate of 1 Hz except the period of unloading of the momentum wheels. As of the middle of January 2008, the LALT already covers almost the entire range of longitude while the orbit plane moves around in a half month. Especially, data density at high latitude regions is sufficient to produce detailed elevation map, which is useful to study the illumination condition of the polar regions. In this presentation, the status of the LALT and initial results of the data analysis will be presented.