Preliminary Results of the Lunar Topography by KAGUYA-LALT Mission

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Japanese lunar explorer KAGUYA (SELENE) which was successfully launched on Sep.14 2007 from Tanegashima Space Center carries laser altimeter (LALT). The objectives of LALT are (1) determination of lunar global figure, (2) internal structure and surface processes, (3) exploration of the lunar pole regions.

General health check of LALT was carried out on September 23rd and on November 1st normally. After the initial tuning of the APD photo detector in the receiving system, LALT has started nominal observation of lunar topography since December 30, 2007. In the middle of January 2008, the LALT covered the entire range of longitude while the orbit plane moves around a half month. This is the first global lunar topography since the Clementine-LIDAR mission. As of February 4 LALT has obtained more than 2.5 million ranged data. The detection probability is more than 98%. It is also confirmed that LALT can detect returned laser signals from the slope ground about 25 degree from 100km altitude. The topography is generated with the orbit/attitude data from KAGUYA tracking/operation center and SPICE toolkit software of Navigation and Ancillary Information Facility in NASA/JPL. Lunar global map is tentatively made with the resolution of 15 or 30km in longitude and 1.5km in latitude. As for polar map, horizontal resolution is less than 2km. We are now revising the orbit and range data for the best topographic map and science goals above. In this presentation we will report the preliminary topographic maps and science results of the LALT mission.