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Operation Summary and Accuracy of the Lunar Topography by KAGUYA-LALT

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Laser altimeter LALT on board KAGUYA has accomplished its lunar topographic observation on 10 June, 2009 and the global topographic data have been released. Parts of the original topographic data have also been opened to the public on 1st November, 2009 from JAXA. We will present final operation results and the accuracy of LALT altimetry.
LALT began its observation on 30 December, 2007 and had been operated normally for more than 3 months by 9 April, 2008, however the laser power went down about 5 mJ in several days. LALT had to moved to the intermittent operation period to avoid further possible power down, and then resumed the normal operation again 6 months later on 11 February, 2009. All of the processed range data amount to 22061182. However the accuracy of topographic data in the extended mission is very poor comparing with data in the nominal mission owing to the lack of S/C tracking data and incompleteness of the lunar gravity field model for the low orbit. Thus released topographic data are restricted within the nominal mission period only (10340750).
Released topographic data are limited in the nominal mission period. The number of them is 10.34 million, however 12 million ranged data obtained in the extended mission period are not merged into the topographic data. The reason is the topographic accuracy of data obtained in the extended period is not good for merging. So we are now trying to reduce the topographic error by the cross-over adjustment using the capabilities of GEODYN-II software. We will show how much improvements are expected by our crossover adjustment comparing with the previous topographic accuracy, and how nuch the topographic error in the extended mission is expected to be reduced.

Keywords: Moon, Laser Altimeter, Topography, Data Processing, Crossover