

Improvement of the lunar topographic model by KAGUYA/LALT - a preliminary report

Yoshiaki Ishihara[1]; Hiroshi Araki[1]; Hiroto Noda[1]; Seiichi Tazawa[1]; Emiko Migita[2]; Nobuyuki Kawano[1]; Sho Sasaki[1]

[1] RISE, NAOJ; [2] SOKENDAI

The Laser ALTimeter (LALT) aboard a main orbiter of Japanese lunar explorer KAGUYA (SELENE) is a ranging instrument that measures the distance between the satellite and the lunar surface with accuracy of 5m by round trip time of the laser light.

As KAGUYA is in a polar orbit, the first global and precise topographic map is expected to be obtained. Especially, previous experiments (ex. Clementine LIDER) had not been gathered high latitude regions (above 75-degree north and south), our LALT will be measure that region for the first time.

The LALT nominal measurement was started on 30th, December 2007 after the some test and adjustment phase on orbit. As of February 2008, the LALT footprints cover twice of the entire moon, and measurement points reached 2,500,000. It is enough to make a preliminary LALT lunar topographic model.

We started to build LALT lunar topographic model, and compare with a previous model. Before LALT, the Unified Lunar Control Network 2005 (ULCN2005) was most precise lunar global topographic model based on a combination of Clementine images and a previous lunar control network derived from Earth-based & Apollo photographs, and Mariner 10, & Galileo images. Comparing our preliminary model with ULCN2005, it is obviously showed that lunar topographic model would be totally (not only polar region, but also equatorial region) refined by our LALT model. Our model is already more accurate and detail than ULCN2005. For example, our model expresses some ridge features that had never been shown in any previous models on near-side mare region.

In our paper, we will show preliminary LALT lunar topographic map, it is surely not the final one, but it is already impressive one.