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The creation of movie for full dome projection using the data of KAGUYA

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Japanese lunar orbiter KAGUYA (SELENE) was launched by the Japan Aerospace Exploration Agency (JAXA) on September 14, 2007. KAGUYA carried 14 scientific instruments to investigate the lunar origin and evolution and to develop the technology for the future lunar exploration. The LALT (Laser ALTimeter) and the TC (Terrain Camera), 2 of the 14 instruments, continuously observed the lunar surface and by using these data, we have created the movie "KAGUYA's Moon" for dome theater.

The LALT is a ranging instrument that emits a laser beam to the lunar surface and measures the distance to it from the main orbiter by the timing delay of the reflected light. It obtained a global and precise topographic data set of the Moon, including the polar regions with a latitude higher than 75 degrees that have never been explored by previous satellites. And the TC has two telescopes with one-dimensional detectors looking at forward and backward directions, respectively. It captured three-dimensional (stereo) images of the Moon's globe with a world's first super high definition of 10m.

After these data were first processed by RISE (Research In Selenodesy) project and TC team respectively, we imported them to Maya which is a high-end 3-D computer graphics software to visualize the lunar surface. By using Maya instead of commonly-used visualization software, we succeeded in improvement of the quality as movie.

This movie is stereoscopic and the size of dome master is 3K. So it can be projected at many digital dome theaters and stereoscopic dome theaters across the nation. And now we are creating the high-definition version. It will be available on the web site of 4-Dimensional Digital Universe (4D2U) project soon.



Keywords: KAGUYA, SELENE, moon, visualization, LALT, TC