MORPHOLOGICAL ANALYSES OF LARGE LUNAR CRATERS WITH LISM/KAGUYA IMAGES.

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Introduction: Various features outside/inside of give important clues to reconstruct and understand impact cratering. Large and fresh lunar craters are best targets, because only space weathering and limited degradations by small impacts are major processes that disturb original structures of ejecta units. Lunar Imager/Spectrometer (LISM), which onboard the Kaguya lunar explorer, will provide high-resolution and multi-spectral mapping data of the Moon. Combination of high-resolution images, digital terrain models, multiband images, and spectral profiles is a complete set for geologic mapping of a crater and its surroundings. Here we introduce a preliminary report on images of the crater Jackson (D = 71 km).

Results: Jackson is a typical fresh crater on the lunar farside. Jackson has a bright ray system with a large forbidden zone in the NW sector and two minor ones in both S and SE sectors. This appearance suggests that Jackson was formed by a oblique impact of the NW-SE direction. Features outside/inside of the crater including secondary craters, ejecta blocks, melt ponds, and slumped terraces should reflected processes of a transient cavity formation and its corruption.

Impact melt ponds The ponds on the ejecta blanket show a heterogeneous distribution, whereas the ponds on the terrace zone do not. There are few small ponds in the uprange (NW-N-NNE) sector. The ponds in the downrange (SE) sector and the side (S-SW) sector are large, and their number density is also high. The ponds in the side range (S-SW) seem to be larger than those in the downrange.

Impact melt sheet Crater floor is mostly filled with a large sheet of impact melt. The uprange half of the floor is characterized with numerous blocky hummocks, ribbon-like pattern weaves and a networked cracks, and the rest half is more smooth. There is a good correlation between the scale of melt deposits (melt ponds and melt sheets) and their surface texture: smaller ones are more smoother.

Terrace structure Morphology of the terrace zone at the up/downrange contrast sharply. The uprange terrace shows a clear stepwise structure, while the downrange terrace is more chaotic. The latter one gradually transforms into hummocks on the crater floor and the central peak. Similar structure is found on famous lunar craters King [1] and Tycho. However, Tycho's corrupted terrace is found at the uprange of this crater [2].

Ejecta blanket Surface facies of the ejecta blanket changes gradually with distance from the rim. Regions closest (< 2-3 km from the rim) to the rim show a intermingled texture of ragged and smooth surfaces. The next outer regions (< 10-15 km from the rim) have fine lineations. Most lineations are concentric with the rim, but others show a cross-hatched pattern. Similar concentric lineations are also found on the surface of the terrace zone. The outermost ejecta blankets have radial ridges.

References: [1] El-Baz, F. 1972. *NASA SP-315*. [2] Margot, J. L. et al. 1999. *JGR*, 1999, 104, 11875-11882.