PHOTOGEOLOGICAL MAPPING OF ORIENTALE BASIN ON THE MOON, LISM/KAGUYA (SELENE).

H. Demura[1], J. Haruyama[2], M. Ohtake[2], T. Matsunaga[3], Y. Yokota[2], T. Morota[2], C. Honda[2], Y. Ogawa[3], M. Torii[2], N. Hirata[1], N. Asada[1], T. Sugihara[4], and K. Saiki[5], [1]University of Aizu, Aizu-Wakamatsu City, Fukushima 965-8580, JAPAN, [2]Inst. of Space and Astronautical Science, Japan Aerospace Exploration Agency, [3]Natl. Inst. for Environmental Studies, [4]Center for Deep Earth Exploration, Japan Agency for Marine-Science and Technology, [5]Osaka Univ. Corresponding author's e-mail address: demura@u-aizu.ac.jp.

Introduction: The Orientale Basin on the Moon is one of the most famous large impact structures. This remains some questions; the size and shape of the crater of excavation and the origin of multiple rings [1]. Its appearance is obviously found on a photogeologic mapping [2], and its diameters of plural ring features are 320, 480, 620, 930, 1300, and 1900 km [3]. Although some might be made of central uplifts or massive slumps, the true crater size has not been fixed yet. It is hard to say which model is plausible for its origin; the mega-terrace model, the nested model, and the ring tectonic theory [e.g. 4]. We need further understanding in the modification stage of cratering and close-up views of the Orientale for collecting obvious evidence. Detailed geometry of faults, slumps, and some emplacement modes would bring restriction of the process of modification stage.

LISM/Kaguya (SELENE): Japanese lunar explorer, Kaguya (SELENE) orbited around the Moon and obtained global photographs by LISM (Lunar Imager / Spectro-Meter) [5-7]. This imager system brings high resolution images and spectrum, which are panchromatic images for reading surface texture (10m/pixel), digital terrain model for quantitative geomorphological discussion, multiband images from visible to near-infrared wavelength for finding mineral and rock composition, the degree of space weathering, etc. Although we have a chance to cover the Orientale Basin soon, present coverage of the site is two strips of digital terrain model and a part of the east side of the basin for multiband images. This presentation would be a quick report of LISM/Kaguya for photogeologic mapping of the Orientale Basin. Of course, additional information derived from gravity modeling [8] and global shape [9] will support our interpretations.

Planned procedures of photogeological analysis: The first step is confirmation of geologic units [2]. This photogeological map with classifications was processed on the basis of medium resolution photographs (0.1 - 0.5 km/pixel) of Lunar Orbiter missions and USSR Zond 8. High resolution images of LISM/Kaguya will refresh the view. Next step is to know emplacement of Orientale Group formations; "Iorm" Massif facies, "Iork" Knobby facies, "Iohi" Inner facies, "Ioht" Transverse facies, "Ioho" Outer facies, and "Iohs" Secondary crater facies. Their boundaries along cliffs or terraces should be surveyed based on detailed surface texture. Third step is to classify some photogeologic units which have been remained undivided because of insufficient pictures, such as Terra Material which is gently rolling terrain with numerous craters and indistinct depressions.

Crater chronology also plays a vital role for these mappings. Panchromatic high resolution images with the digital terrain model give a size distribution of sub-km craters. Obtained stratigraphy based on its relative age and geometrical emplacement in the Orientale Basin will bring insight to modification stage for large impacts.

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