TiO_2, FeO, and texture analysis map of Lunar crater Ina, based on SELENE Multi-band Imager data. A. Yamamoto[1] , R. Furuta[1], M. Ohtake[2], J. Haruyama[2], T. Matsunaga[3] and H. Otake[2], [1]Remote Sensing Technology Center of Japan (RESTEC) , TOKYU REIT Toranomon Bldg. 2F, 3-17-1, Toranomon, Minato-ku, Tokyo 105-0001, Japan, [2]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science (JAXA/ISAS), [3]National Instisute for Environmental Studies, Japan (NIES), (aya@restec.or.jp)

Introduction: On the near side of the Moon, there is an unique shape crater Ina in Lacus Felicitatis. First, astronauts paid attention to this crater and took several photos in Apollo 15 and 17 mission [1][2], and recently Lunar Reconaissance Orbiter (LRO) had observe this letter "D" shape crater in detail by Narrow Angle Camera (NAC) of the Lunar Reconnaissance Orbiter Camera (LROC) [3]. These image and data tell us that Ina is relatively young and supposed to show recent volcanic activity record.

Japanese lunar exploration mission KAGUYA (SELENE) had observed lunar surface and its environment with 15 instruments from 2007 to 2009 [4], and Multiband-Imager (MI) has capability to illustrate compositional information of lunar surface in 20m resolution. In this study, we try to make titanium and iron map in/around Ina crater. In addition to compositional map, texture analysis result using MI data was studied.

Data and analysis area: We used KAGUYA MI data which have already calibrated and converted to reflectance value with the method disclosed in Ohtake 2010 [5]. We also used DTM data derived from KAGUYA Terrain Camera (TC) stereo data [6] for our analysis. Our target area, Ina crater is at the north of Mare Vaporum, between Montes Apenninus and Montes Haemus, and we prepare the MI mosaic data set (Top left: 19N,5E, Bottom right: 18N, 6E).

Results and Discussion: In Schultz et al (2006) [7], Clementine data show high titanium basalts feature in Ina crater. Though there are little difference between color ratio map of Clementine and that of Kaguya/MI data, we calculated TiO_2 and FeO map by using the techniques and algorithms presented by Otake et al [8] from MI reflectance data set,. The crater interior of Ina, very high Ti-content area (more than 30wt%) are exhibited (Fig.1). From our calculation, FeO map shows negative values at around target site. From DTM data, we calculate the slope angle for the target site, and there are steep terrain in/around crater Ina. Those feature may cause the extremely high Ti value and negative FeO value, or we need to modify the algorithm for this site. We also calculate several parameters from MI band1/band2 ratio image. Calculated six parameters area; energy, texture, entropy, contrast, mean, standard deviation. We make the RGB color composite image from texture analysis result (RGB: contrast, entropy, texture) . Though this image (Fig. 2) shows color gap between right part and left part which is due to the mosaic process, around ina crater area indicate some correlation with TiO_2 content map.

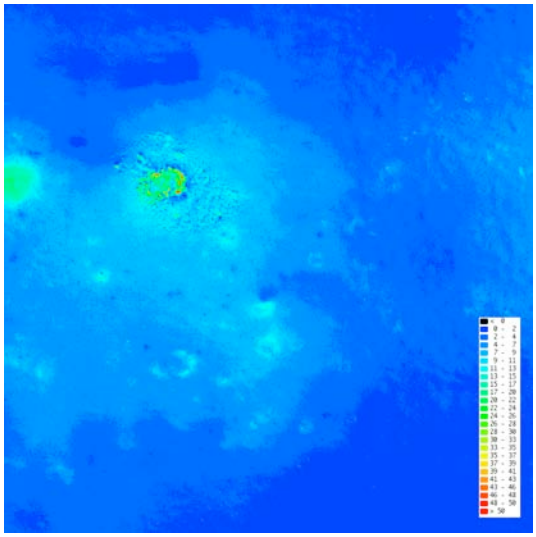

Figure 1. TiO_2 map for target area

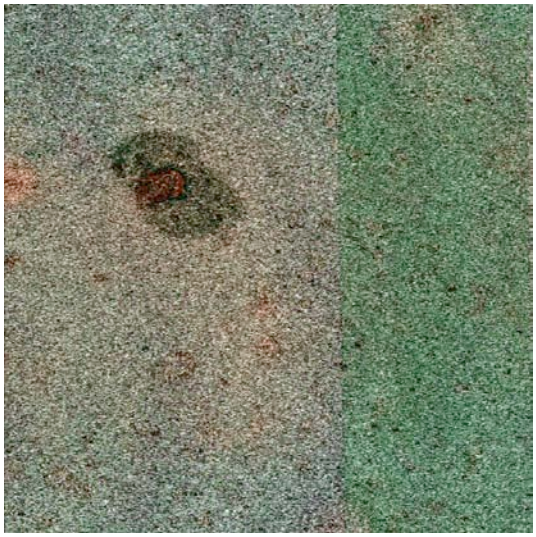

Figure 2. Texture analysis result image for target area

References: [1] AS15-81-11013 [2] AS17-152-23286 [3] http://wms.lroc.asu.edu/lroc/ [4] Kato M. et al (2010) *Space Science Reviews*, *154*, *1-4* [5] Ohtake M. et al (2010) *Space Science Reviews*, *154*, *57-77* [6]Haruyama et al (2012) *LPSC XLIII*, Abstract #1200 [7]Schultz et al (2006) *Nature*, *444*, 184-186 [8]Otake H. et al (2012) *LPSC XLIII,* Abstract #1905.