

Rock and mineral distribution of the lunar South Pole-Aitken basin

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South Pole-Aitken (SPA) basin is one of the largest basin (2500 km in diameter [1]) on the lunar farside. In pre-vious studies, it has been suggested that most of the crustal material was excavated and that the mantle materials have been exposed [e.g., 1]. Particularly, because this excavation was the biggest at the central area of the basin, mantle materials exposed. Mantle material of this area is melted by the basin impact and produced impact melt [e.g., 2], therefore we suggest that investigation within this impact melt area lead up to understand mantle material conpo-sition. However, because SPA is very old and large, we cannot identify the impact melt area. In our study, we pro-duce a new mineralogical map of SPA basin interior, based on data derived from SELENE Multiband Imager (MI). In particular, we investigated mineralogy within the central depression of SPA by iron and titanium concentration and altitude data derived from SELENE. Using these method, we identified the impact melt area of SPA.

We produced a mineralogical map within the central depression of SPA. As a result, we classified into three mineral type layers on this map ; low-Ca pyroxene layer, high-Ca pyroxene layer and very high-Ca pyroxene layer. From correlations of these layers and occurrences, we created the column diagrams of respective areas. Then, we suggested origins of these mineral type layers : The high-Ca pyroxene layer is impact melt area of the basin. The low-Ca pyroxene layer and the very high-Ca pyroxene layer is the ejecta of SPA basin and mare erupted after SPA basin formation, respectively. In fact, the area of the high-Ca pyroxene layer is impact melt area of SPA. In the fu-ture work, we will analyze mineral and chemical compositions within this area.

References: [1] Spudis et al., 1994. [2] Pieters et al., 2000

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