

## Global distribution of olivine exposures on the Moon revealed by Spectral Profiler on SELENE/Kaguya

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Since the Moon has been considered to have an olivine-rich mantle, olivine exposure on the lunar surface is an important target for studying the entire composition and the evolution of the Moon. However, the discovery of olivine-exposure sites has been very limited to date. Two nearside craters have been reported to show olivine-rich spectral features based on Earth-based telescopic observations. Earth-based observations produce continuous reflectance spectra, but the observational points are sparse and limited to the lunar nearside. On the other hand, the remote sensing missions such as Clementine provide the global data of the Moon; Clementine UV/VIS with five discrete bands (<1.0 micron) identified the Olivine Hill in the South-Pole Aitken (SPA) and the central peaks of the Theophilus, Langrenus, Keeler, Crookes, and Tsiolkovsky craters as possible olivine-bearing sites. However, after a reexamination using data taken by Spectral Profiler (SP) onboard the Japanese explorer Kaguya, the central peak of the Tsiolkovsky crater was classified as a mixture of plagioclase and pyroxene, rather than as pure olivine. This finding by SP demonstrated the importance of obtaining continuous reflectance spectra over the UV, visible, and NIR range covering the entire 1 micron band diagnostic of olivine and other silicates in identifying olivine exposure sites on the Moon.

SP has obtained continuous spectral reflectance data for 69,228,098 points (0.5 by 0.5 km footprint) on the Moon over the wavelength range of 0.5-2.6 micron and a spectral resolution of 6-8 nm during its mission period from November 2007 to June 2009. In this study, we report the global distribution of olivine exposures on the Moon revealed by SP.

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