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Global distribution of high Mg# orthopyroxene on the moon: A constraint on the lunar upper mantle composition

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The South Pole-Aitken basin (SPA) is the biggest and oldest impact structure on the southern farside of the Moon. If proportional impact scaling is valid, the gigantic SPA impact should have completely blasted away the feldspathic upper crust and produced a huge impact melt pool by melting the upper mantle. Owing to the hyperspectral survey by Spectral Profiler (SP) onboard KAGUYA, we found an extensive ultramafic layer inside SPA dominated by Magnesium rich orthopyroxene (Nakamura et al. 2009). This layer would reflect the composition and fractionation process of the huge impact melt and parent upper mantle. In this presentation, we report the results of global survey of the magnesium rich orthopyroxene by SP and discuss the implication on the composition of the lunar upper mantle.

Keywords: Kaguya, Moon, Mineralogy, Spectra, Mantle, Impact melt