Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

PPS01-05 Room:101B Time:May 22 16:30-16:45

Impacts on porous regolith soils to form volatile-rich interior on the Moon and Mercury

MIURA, Yasunori[1*]

[1]Visiting (Univs.)

The results in this study are summarized as follows:

1) Surfaces of Earth-type planets are considered to be covered by large crystalline basement rocks (Earth) and by porous glassy regolith soils (the Moon and Mercury).

2) The Moon with heterogeneous surface rocks shows heterogeneous aggregates of broken blocks by multiple impacts. This is because data of density, porosity and age suggests that primordial lunar highland anorthosite and breccias reveal mixed target materials with voids, glasses and crystals formed by multiple impacts, and because data of FeO, Ni, Co and C contents and age indicate first FAN sample with dynamic impact process (Miura, 2012, in press).

3) Lunar regolith soils reveal carbon and light elements-rich materials (even in drilled core). This indicates that porous soils texture penetrates light elements to deeper interior, and that less eject with volatile elements on porous target rocks produces airless Moon (maybe Mercury also) (Miura, 2012; in press).

4) Porous textures of regolith soils are considered to be separated to Fe-rich deep interior and Fe-poor surface mainly due to gravitational forces from large iron-rich core on Mercury. However Fe-poor lunar interior reveals poor separation of Fe-bearing projectiles during impact process and crustal evolution.

5) Main differences of interior structure (with Fe contents) with similar sizes produce probably surface crusts on the Moon (low density) and Mercury (high density) finally.

Keywords: porous regolith soils, Moon and Mercury, volatile elements, interior formation, iron core, interior reservoir