

## Solar wind proton reflection by lunar crustal magnetic fields observed at low altitude

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We study interaction between the solar wind flow and lunar crustal magnetic fields observed at lower altitudes by SELENE (Kaguya), predominantly focusing on proton reflection above strong crustal fields. Several studies revealed interaction between the solar wind and the Moon, while detailed observation at low altitude including ion measurements has been hardly reported yet. Previous observations at higher altitude revealed that the solar wind protons are not reflected toward the sun but deflected downstream around the solar wind flow direction. Here we report detailed observations of solar wind proton reflection/deflection observed above South Pole-Aitken (SPA) basin at low altitude (typically, lower than 30 km) and at several solar zenith angles. Above wide crustal fields inside the SPA basin, a large amount of incident solar wind protons are deflected and sometimes reflected to come back sunward; in particular, the sunward proton beams are observed at lower solar zenith angle regions. The reflected/deflected protons at times consist of two (or more-than-two) separate components that have been mirror-reflected at different crustal fields. Our result shows that the mirror reflection of incident protons takes place at the altitude much lower than the spacecraft orbit, and suggests that strong compression of the crustal fields at lower solar zenith angle and at lower altitude by the solar wind dynamic pressure is essential.