The observation of high energy reflected and accelerated ions at the lunar surface by MAP-PACE on

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Because the Moon has neither thick atmosphere nor global intrinsic magnetic field, it had been thought that solar wind ions hitting the Moon are all absorbed at the lunar surface. However, by the observations from low energy charged particle analyzers MAP-PACE on the lunar orbital satellite Kaguya "SELENE", it is found that 0.1-1% of these solar wind ions are not absorbed but reflected back from the surface, and that some of them are accelerated to around six times higher than the original solar wind energy.

These accelerated ions are observed in the specific lunar latitude and longitude regions regardless of positional relationship between the Moon and the Sun. They are observed three or four times a month when the Moon is exposed to the solar wind, in addition, when the solar wind parameter values (density, velocity, temperature, total pressure and magnetic field intensity) are high. The reverse-tracking of the particles observed by PACE provides that these ions are reflected at the magnetic anomalies around the South Pole-Aitken basin.