

## Lunar sodium exosphere observed by SELENE(KAGUYA) MAP-PACE

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The Moon maintains thin atmospheres. The lunar atmosphere is called 'surface-bounded exosphere' because it is thin enough to be regarded as an exosphere and it bounds on the solid surface differently from the Earth's atmosphere-bounded exosphere. Although there have been only limited ion measurements by lunar orbiters, ground-based optical observations have succeeded in detecting the lunar sodium and potassium atmospheres.

One of the scientific objectives of MAP-PACE (MAGnetic field and Plasma experiment-Plasma energy Angle and Composition Experiment) onboard SELENE (SELenological and ENgineering Explorer) (KAGUYA) is to observe ions originating from the Moon. After the exospheric particles are ionized by solar photons, the ionized particles are transported by the solar wind in a cycloidal motion if the solar wind's electric and magnetic fields are steady and their initial energy is negligible. Although some of the ions picked-up by the solar wind hit the lunar surface and are reabsorbed, the others are driven into space.

MAP-PACE have observed heavy ions around the Moon. It is confirmed that the ions include carbon, oxygen, sodium and potassium and that they originate from the Moon. Here, we focus on the sodium because sodium is predominant compared to other species and many detailed ground-based observations of the lunar sodium exosphere have been reported. We show the sodium ions that originate from the lunar exosphere are accelerated by the solar wind electric field. We have estimated the sodium flux in a variety of the solar wind conditions. We have also estimated the sodium flux during some meteor showers.