

## Plasma observations above strong lunar crustal fields in the solar-wind wake

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Plasma signature around crustal magnetic fields is one of the most important topics of the lunar plasma sciences. Although recent spacecraft measurements are revealing solar-wind interaction with the lunar crustal fields on the dayside, plasma signatures around crustal fields on the night side have not been fully studied yet. Here we show evidence of plasma trapping on the closed field lines of the lunar crustal fields in the solar-wind wake, using SELENE (KAGUYA) plasma and magnetic field data at 15 km altitude. In contrast to expectation on plasma cavity formation at the strong crustal fields, electron flux is enhanced above one of the strongest crustal fields, Crisium Antipode (CA), where the magnetic field along the spacecraft orbit is as strong as 80 nT. The enhanced electron fluxes above CA are characterized by bidirectional beams in the lower energy range (typically lower than 100 eV), which shows that these electrons are trapped on the closed field lines of the crustal magnetic fields, although a possibility of opened field configuration with cusps is not totally excluded. The observed electrons on the closed field lines may come from the lunar night side surface, while the mechanism of electron supply onto the closed field line remains to be solved.

Keywords: Lunar crustal field, Lunar plasma environment, Lunar wake, SELENE (KAGUYA)