Observing the lunar ionosphere with SELENE radio scinece

Takeshi Imamura[1]; Takahiro Iwata[1]; Nanako Mochizuki[1]; Yusuke Kono[2]; Koji Matsumoto[3]; qinghui Liu[4]; Hirotomo Noda[3]; Hideo Hanada[3]; Koh-ichiro Oyama[5]; Yoshifumi Futaana[6]; Akinori Saito[7]; Hiroki Ando[8]

[1] ISAS/JAXA; [2] NAOj; [3] RISE, NAOJ; [4] NAOJ; [5] ISAS; [6] IRF; [7] Dept. of Geophysics, Kyoto Univ.; [8] Earth and Planetary Science,Tokyo Univ

The electron density profiles above the lunar surface are being observed by the radio occultation technique during the mission using the Vstar and Rstar sub-satellites. In addition to a traditional technique which uses one orbiter, we are conducting another method which uses two orbiters with the second one being used to measure the terrestrial ionosphere contribution. Previous radio occultation measurements have indicated the existence of an ionosphere with densities of up to 1000 cm-3 above the dayside lunar surface. These densities are difficult to explain theoretically when the removal of plasma by the solar wind is considered, and thus the generation mechanism of the lunar ionosphere is a major issue, with even the validity of previous observations still under debate. The SELENE radio science experiment will establish the morphology of the lunar ionosphere and will reveal its relationship with various conditions to provide possible clues to the mechanism.