R006-28
B 会場 ： 11/27　PM1（13:45-15:45）
14:15〜14:30:00

#西田 結衣 [1)], 三好 由純 [1)], 浅村 和史 [2)], Kistler Lynn[3)], 篠原 育 [2)]
([1] 名大 ISEE, [2] 宇宙航空研究開発機構, [3] ニューハンプシャー大学

Long-term Variations of He++ Ions in the Inner Magnetosphere: Observations by Arase LEP-i

#Yui Nishida[1)], Yoshizumi MIYOSHI[1)], Kazushi ASAMURA[2)], Lynn Kistler[3)], Iku SHINOHARA[2)]
([1]ISEE/Nagoya University, [2]ISAS/JAXA, [3]University of New Hampshire

He++ ions in the inner magnetosphere primarily originate from the solar wind and can serve as a tracer of solar wind-origin ions. However, their spatial and temporal variations remain poorly understood due to the limited number of satellite observations with sufficient mass resolution. The Low-Energy Particle (LEP-i) instrument onboard the Arase satellite provides high mass resolution and enables clear discrimination among ion species, including He++. In this study, we analyzed Time-of-Flight (TOF) data from LEP-i with a 10-min time resolution to investigate the long-term variations of He++ ions in the inner magnetosphere and their dependence on L-shell. Our analysis covers the period from the declining phase of Solar Cycle 24 through the rising phase of Solar Cycle 25.

We found that the ratio of He++ and H+ (19 keV/q) has a clear solar cycle dependence. The ratio varies distinctly between the outer ($L \geq 4.5$) and inner ($L < 4.5$) magnetosphere, suggesting differences in loss time scales, likely due to charge exchange process. Furthermore, we found that the He++/H+ ratio observed by Arase LEP-i is correlated with solar wind speed, which is similar variation to the He++/H+ ratio in the solar wind. Unlike previous studies, observations by the Arase satellite's LEP-i instrument suggest that He++ counts depend on both solar activity and geomagnetic activity. These findings suggest that He++ ions in the inner magnetosphere retain signatures of their solar wind origin and serve as useful tracers of solar wind-origin plasma in the inner magnetosphere.