

**R006-32**

**A 会場 : 9/27 AM1 (9:00-10:30)**

**9:45~10:00**

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## **Statistical study of the overlap region between plasmasphere and ring-current ions using the Van Allen Probes satellites**

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In the Earth's inner magnetosphere at the region about 4-6 times of the Earth's radius, low-energy dense plasma in the plasmasphere partially overlaps with the high-energy plasma regions called the ring-current. The interaction of these two plasma regions through Coulomb collisions and various electromagnetic waves causes acceleration and disappearance of the particles. Past conjugate observations using magnetospheric satellites and ground-based all-sky cameras have shown that Stable Auroral Red arcs, Isolated Proton Aurora, and STEVE, which are optical phenomena seen at subauroral latitudes, always originate in this region. However, there are limited number of conjugate observations between magnetospheric satellites and ground-based all-sky cameras, and no statistical analysis has been conducted about the overlap of the plasmasphere and the ring-current region. This study aims to statistically characterize the geomagnetic index, local time, and solar activity dependence of the overlap region using the Van Allen Probes-B satellite in the inner magnetosphere. We defined the region of overlapping of plasmasphere and ring-current ions as the region where the plasma density is higher than  $300 \text{ cm}^{-3}$  and total ion energy flux is higher than  $5 \times 10^{10} \text{ keV cm}^{-2} \text{ s}^{-1} \text{ sr}^{-1}$  for the HOPE ion energy range of 0.001 - 55.650 keV. This criterion of overlap is defined based on our previous study of the source region of STEVE, SAR arcs and red/green arcs using 9 ground-satellite conjunction events (Sugimura et al., JpGU2023). We found 50570 data points of overlaps during the 3-year data from January 2015 to December 2017. The preliminary analysis shows that the plasmasphere and ring current overlap most frequently from midnight to dusk local times. From superposed epoch analyses, the AL index is ranging from -200 nT to -250 nT during  $\pm 3$  hours from the overlap time. The SYM-H index was  $\sim -25$  nT during the overlapping time. These results indicate that the overlapping of plasmasphere and ring-current ions occur during geomagnetically active time from midnight to dusk local times. This result indicates the preferable condition of STEVE and SAR arcs at subauroral latitudes.