satellite during 2003-2005 are analyzed to examine the tidal effects on their vertical emission rate according to the solar and geomagnetic activities. The data are restricted at latitudes 60°S - 60°N to avoid the contributions by the auroral emission. The variation of the vertical emission rate in latitude and local time is summarized in the yaw periods. The vertical emission profiles of the O2 (0-0) Atmospheric band nightglow averaged in the 10° latitude range are investigated. The result shows the inverse relationship between the peak emission height and the integrated brightness.

[IV-1-3] Seasonal and solar activity variations of the Weddell Sea Anomaly observed in the TOPEX TEC measurements

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The Weddell Sea Anomaly (WSA) in the ionosphere is characterized by higher plasma density at night than during the day in the region near the Weddell Sea. According to previous studies on the WSA, it is known to occur mostly in southern summer and has not been reported in other seasons. We have utilized more than 13-year TOPEX TEC measurements in order to study how the WSA varies with seasons and how it changes with solar activity. The TOPEX TEC data have been extensively utilized for the climatological study of the ionosphere due to its excellent spatial and temporal coverage. We investigate the seasonal and solar activity variations of the WSA using four seasonal cases (Mar. equinox, Jun. solstice, Sep, equinox, and Dec. solstice) and two solar activity conditions (F10.7<120 for solar minimum and F10.7>120 for solar maximum conditions) for geomagnetically quiet periods. Our analysis shows that the WSA occurs only in the southern summer hemisphere for low F10.7, as in previous studies, but the WSA occurs all of seasons except for winter when F10.7 is high: it is most prominent during the December solstice (southern summer) and still strong during both equinoxes. The WSA appears to be an extreme case of global longitudinal variations at mid- and high-latitudes.

[IV-1-4] Polar rain flux variations in northern hemisphere observed by STSAT_1 with IMF geometry.

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Polar rain is a spatially uniform precipitation of electrons with energies around 100eV that penetrate into the polar cap region where geomagnetic field lines are connected to the Interplanetary Magnetic Fields (IMF). Since their occurrences depend on the IMF sector polarity, they are believed to originate from the field aligned component of the solar wind. However, statistically direct correlation between polar rain and solar wind has not been shown. In this presentation, we examined specifically the IMF strength influence on the polar rain flux variation by classifying of IMF sector polarities. For this study, we employed the polar rain flux data measured by STSAT-1 and compared them with the solar wind parameters obtained from the WIND and ACE satellites. We found the direct mutuality between polar rain flux and IMF strength with correlation coefficient above 0.5. This proportional tendency appears stronger when the northern hemisphere is in the away sector of the IMF, which could be associated with a favorable geometry for magnetic reconnection. Simple particle trajectory simulation clearly shows why polar rain intensity depends on the IMF sector polarity. These results are consistent with the direct entry model of Fairfield et al.(1985), while low correlation coefficient with solar wind density, the similarity between slops of both energy spectra shows that transport process occur without acceleration.

■ Session II-2 : Orbit 1
Wednesday, 22 October [14:20-15:35]

[II-2-1] Multiple revolution Lunar Trajectory Design using Impulsive Thrust

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The direct way to the moon is to start from the parking orbit by using impulsive thruster In previous domestic research, the direct way has been studied by using a single impulsive shot. However, when a single impulsive shot occurs to go into a Translunar orbit, gravity losses occur because thruster is not impulsive shot but the finite burns and it causes the gravity losses. To make up for the weak point of a single impulsive shot, this paper divides TLI (Trans Lunar Injection) into several small burns. Therefore,