plasmapause. The ionospheric disturbances in the total electron content (TEC) maps shows that the steep TEC gradient is formed at the boundary of the positive ionospheric storm in low-middle latitudes and the negative ionospheric storm in middle-high latitudes. We interpret that the thermospheric neutral composition disturbance in the dayside is confined within the middle-high latitude ionospheric convection zone. The neutral composition latitudes and, therefore, the locations of the steep plasma density gradient coincide with the footprints of the plasmapause. The TEC maps show that the appearance of the steep plasma density gradient in the pre-midnight sector during the recovery phase is related to the co-rotation of the gradient that is created during the main phase.

[IV-1-2] Long-term variation of total electron contents over Daejeon measured from Global Positioning System between 2000 and 2010

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This study is about the ionospheric variation on the Korean Peninsula using GPS TEC data from Daejeon IGS GPS site. It has accumulated the 11 years GPS data from 2000. In this work, the hourly and daily averaged TEC data are used. Data period covers a full solar cycle from 2000 to 2010 (11 years) which the total observed days are 98%. The mean TEC data shows the annual/semiannual variation, solar cycle and 27 days. GPS TEC has a good correlation with solar F10.7 index. We also compare with planetary Kp and AE indices. The maximum of the daily mean GPS TEC is around 50 TECU at 2000 and that value of 2009 is near 10 TECU. we confirms that the GPS TEC is a good indicator for ionospheric variation for the mid-latitudinal region to understand the ionospheric climatology over Korea Peninsula.

[IV-1-3] GPS TEC Responses to Solar Flare Eruption and Geomagnetic Storm in 2011

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The Total Electron Content (TEC) measured from Global Positioning System (GPS) can be continuously or peculiarly increased (positive ionospheric storm) or decreased (negative ionospheric storm) with solar and geomagnetic activities as well as the chemical and dynamic processes with thermosphere in the mid-latitudes. The ionospheric storm is not easy to predict owing to its difficult mechanism, and the real-time GPS TEC monitoring may be useful to follow ionospheric response to solar and geomagnetic storms. Korea Astronomy & Space Science Institute has continuously monitor GPS TEC over Korea Peninsula in near real-time of 10 minutes to watch ionospheric immediate responses to solar and geomagnetic activities. In this presentation, we will report the variation of GPS TEC over Daejeon and JeJu in Korea during the period of solar flare eruption and geomagnetic storm events in 2011. These events in 2011 will be compared with the event in October 2003 and November 2004.

[IV-1-4] Comparison between Ionospheric and plasmaspheric TECs measured from JASON satellite: plasmaspheric flux

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The plasmasphere is filled with the ions and electron transported mostly from the mid-latitude ionosphere. In the topside ionosphere where the O^+ ions are still major ions, the O^+ ions are in chemical equilibrium with the H^+ ions and exchange their charges with each other's parent atoms with similar rates in both reactions. During the day, the newly produced H^+ ions flow upward to fill the plasmasphere while they flow downward and contribute to the maintenance of the ionospheric density at night under the geomagnetically quiet condition. The ionosphere and plasmasphere are coupled by these plasma fluxes and therefore strongly affect each other. In order to study these coupling we utilized the plasma density measurements from JASON satellite. This satellite measures vertical total electron content (TEC) from the ground to the satellite orbit (about 1336 km) and slant TEC from the satellite orbit to much higher GPS satellites by using the on-board dual-frequency altimeter and GPS receiver, respectively. The former measurement can represent the ionospheric TEC while the latter can represent the plasmaspheric TEC in the equatorial region. We compared these data with different seasons, solar activities and local times, and the results will be presented.

■ Session : 초청강연 II
4월 29일(금) 10:40 - 11:20 제1발표장

[IS-02] 거대망원경 시대와 한국 광학천문학의 미래 전망

박병곤

한국천문연구원

GMT 거대망원경 개발사업 참여를 계기로 한국의 광학천문학은 비약적인 발전의 계기를 맞게 되었다. 거대망원경의 개발을 위한 첨단 광학 및 광기계 기술 확보와 더불어 이 망원경을 이용한 세계적인 연구 성과의 창출이 가능해질 전망이다. 2011년 현재 세계적으로 진행되고 있는 GMT, TMT, E-ELT 등 세 개의 거대망원경 개발사업은 2020년대 초반이면 완료될 전망이다. 이 발