

## Variations of TEC in the upper ionosphere and plasmasphere by the GRACE satellite.

# Yukari Goi[1]; Akinori Saito[2]; Takuya Tsugawa[3]; Michi Nishioka[2]; Naomi Murakami[2]

[1] none; [2] Dept. of Geophysics, Kyoto Univ.; [3] NICT

Variations of Total Electron Content in the upper ionosphere and plasmasphere were studied with TEC data observed by the GRACE satellite. The GPS receiver on the GRACE satellite receives the dual-frequency of the GPS signal to detect the precise location of the satellite. The GRACE-TEC date between GRACE satellite and GPS satellite was derived from this GPS date. The altitude of the GRACE satellite orbit is around 500km. The GRACE-TEC data consist of TEC of the upper ionosphere and plasmasphere. Several types of GRACE-TEC variation were observed at middle and high latitudes. In the low-latitude region, the enhancements of GRACE-TEC caused by the Equatorial Ionized Anomaly was observed frequently. These TEC variation at middle and high latitude was classified into four types: TEC enhancement region, TEC depletion region, TEC boundary region, TEC disturbance region. It was found that the TEC enhancement region was the highest occurrence rate region. The comparison of GRACE-TEC with the other observational data clarified that the TEC enhancement region would be caused by three phenomena, Cusp, Storm Enhanced Density (SED), Plasmapause. The phenomena in the upper ionosphere and plasmasphere were studied using GRACE-TEC data and the other observational data.