Total electron content variations over Korean peninsula response to the interplanetary events

Eun-Young Ji[1], Byung-Kyu Choi[2], Khan-Hyuk Kim[2], Dong-Hun Lee[1], Jung-Ho Jo[2], Jong-Kyun Chung[2], and Jong-Uk Park[2]

[1]*Dept. of Astronomy and Space Science, Kyung Hee University, Yongin, Kyunggi 449-701, Korea*

[2]*Korea Astronomy and Space Science Institute, Yusong, Daejon 305-348, Korea*

By analyzing the observations from a number of ground- and space-based instruments, including ionosonde, magnetometers, and ACE interplanetary data, we examine the response of the ionospheric TEC over Korea during 2002-2003 interplanetary event. We found that the variation of vertical TEC is similar to that of the dawn-to-dusk interplanetary electric field. Within a few (1-5) hours of the time when the enhanced interplanetary electric field impinged on the magnetopause, TEC values increase more than 20%. And the vertical E×B drift (estimated from ground-based magnetometer equatorial electrojet delta H) showed upward drifts in the dayside and downward in the nightside, which may be due to the penetration of strong magnetospheric electric fields probably driven by an increase in the solar wind dynamic pressure. These results suggest that the variations of TEC are sensitive to the dawn-to-dusk interplanetary electric field which might promptly affect the ionosphere.