[SO19] Total electron content variations over Korean peninsula associated with interplanetary electric fields during geomagnetic storms

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 2003 geomagnetic activities. We found that the variation of vertical TEC is similar to that of the 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%. The vertical E×B drift (estimated from ground-based magnetometer equatorial electrojet delta H) showed strong downward drifts, which may be due to the ionospheric electric field produced by the large amount of energy dissipation into high-latitude region. These results suggest that the variations of TEC over Korea can be produced by intense disturbance electric fields originating from the magnetosphere-ionosphere interaction.

[SO20] Calculation of the mode conversion coefficient between Langmuir waves and ordinary electromagnetic waves in an inhomogeneous warm plasma

최문영[1], 이동훈[1], 김경섭[1], 김기홍[2]
[1]*경희대학교 우주과학과,* [2]*아주대학교 에너지 시스템 학부*

Langmuir waves, that are generated near the solar atmosphere, can be converted to the ordinary electromagnetic waves through the mode conversion. It is commonly accepted that the coefficients for the mode conversion is equal in magnitude to that of the inverse conversion when the dissipation arising from collisions is negligible. In this study, we compute exact values for the reflection, transmission, and mode conversion coefficients between Langmuir waves and o-mode waves by adopting the Invariant Imbedding Method(IIM) in unmagnetized inhomogeneous plasma with a finite temperature. We examine whether the reciprocity principle is conserved or not when the dissipation is included.