

Reconstruction of topside ionospheric profile applying dynamic equilibrium based on GPS-TEC and ionosonde measurements

Reiko Yoshimura[1]; Takashi Maruyama[1]; Seiji Kawamura[1]

[1] NICT

A method for retrieving the topside electron density distribution applying dynamical equilibrium will be presented. In the topside ionosphere (above the F layer peak), plasma distributions are controlled by the plasma transport process; field-aligned upward plasma flows supply plasma in the plasmasphere during the daytime, while downward flows contribute to maintain the nighttime F region. This field-aligned plasma flux is considered in the dynamical diffusive equilibrium state. To reconstruct the topside plasma profile, TEC obtained by GPS satellites and foF2/M3000F2 measured by ground-based ionosonde systems are utilized. O⁺ - H⁺ transition height is one of the key parameters to determine the shape of the plasma distribution, which is adjusted to reproduce the observed TEC by integrating the reconstructed plasma density profile. The method is verified by comparing the scale heights with those of observation profiles obtained by MU radar and ALOUETTE/ISIS satellite measurements.