

## Analysis of the short scale fluctuations of total electron content using the GPS one second data

# Akimasa Tachibana[1]; Akinori Saito[2]; Michi Nishioka[3]

[1] SPEL, Kyoto-University

; [2] Dept. of Geophysics, Kyoto Univ.; [3] SPEL, Kyoto-University

Characteristics of the shorter scale fluctuations of Total Electron Content (TEC) than two minutes were studied using the GPS one second data.

Ionospheric electron density fluctuations are interpreted to be generated by the atmospheric wave or the plasma instabilities. Because the Brunt-Visala frequency is about ten minutes in the thermosphere, the atmospheric wave that cause the electron density fluctuations whose period is shorter than two minutes would be the infrasonic wave. The short scale fluctuations of GPS-TEC in 2004 in Kyoto was studied. It was found that the short period fluctuations of TEC were not detected during the daytime, and several events were detected during the nighttime. These fluctuations were found to propagate to the south-west direction. While the noise level of the TEC measurement by the ground-based GPS receiver was 0.05TECU (TEC unit:  $10^{16}$  electron  $m^{-2}$ ), the amplitude of the intense fluctuations was up to 0.4TECU. The south-west propagation is the common characteristics with the Medium-Scale Traveling Ionospheric Disturbance (MSTID) and the intense short-scale fluctuation was detected associating with MSTID. This result indicates that the large-scale ionospheric structures, such as MSTID, contained the small-scale fluctuations, and propagated together.