

Scale dependence of the ionospheric disturbances observed by GPS receiver networks and SuperDARN

Syunta Okamoto[1]; Akinori Saito[2]; Toshihiko Iyemori[3]; Michi Nishioka[2]

[1] none; [2] Dept. of Geophysics, Kyoto Univ.; [3] WDC for Geomag., Kyoto Univ.

Spatial variations of the ionospheric structures using the data of were studied. Global positioning System (GPS) is a satellite positioning system with the satellites at about 20,000km altitude. Total Electron Content (TEC) is derived from the delay time of the GPS radio waves in the ionosphere. GPS receiver networks can observe the ionospheric disturbances whose scale size is from several kilometers to one thousand kilometers. SuperDARN is a global network of HF radars in the northern and southern hemispheres. This system can observe the occurrence of the F region Field Aligned irregularity (FAI). FAI reflects the radio waves whose scale size is twice of its wavelength. Since SuperDARN uses the radio waves of 8-20MHz frequency, the scale size of the irregularities detected by SuperDARN is about 15-35m. We compared the moment data of SuperDARN with the GPS-TEC data observed by more than 50 receivers in high latitude region in the both hemispheres. The dependence of the spatial scale was studied by spectral analysis of GPS-TEC, and SuperDARN data.