[초 SE-01] The 27-Day Modulation of the Low Latitude Ionosphere during a Solar Maximum

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The 27-day solar modulation of the low latitude ionosphere is investigated for the solar maximum period using in situ satellite measurement data as well as the total electron contents (TEC) estimated from the satellite signals of the Global Positioning System (GPS). While the density and temperature of the topside ionosphere observed at an altitude of 685 km manifest delayed responses to the 27-day variations in the daily F10.7 values, similar to those previously reported for an altitude of 840 km, the nighttime scale height, obtained by comparing the densities observed at altitudes of 685 km and 840 km at similar local times, was shown to vary in accordance with the changes in F10.7 with the same time delay. The oxygen ion fraction measured at an altitude of 840 km shows a similar response regardless of the local time. Moreover, the GPS TEC values, most of which come from the F peak region, also exhibit similar delayed modulations in accordance with the solar rotation. The TEC value correlates well with the thermospheric neutral density, and both are observed to be modulated with the solar rotation with time delay, especially when a long term variation is filtered out. The present result confirms that the whole thermospheric and ionospheric system is modulated with the solar rotation.

[SE-02] FUV spectral analysis of the relativistic electron aurora (REA)

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The auroral emissions are usually occurred by impacts of several keV precipitating electron to the ionospheric elements. While these several keV electrons effects on aurora phenomenon is well-known in the auroral science, the precipitating “hard” electron roles have been scarcely examined because of insufficient particle data. SPP aboard STSAT-1 had observed both low energy (100eV~20keV, ESA) and high energy (170 ~ 360keV, SST) electron with FUV (far ultraviolet) spectrograph which is known as FIMS. We checked the FUV auroral emissions shows good correlation with incident electron energy flux. We also examined that the line spectral variation depends on the peak energy of precipitating electron with STSAT-1 one year data from Nov. 2003 to Oct. 2004. Among these one year data, we found the coincident events between the ESA and SST data which have relativistic electron phenomenon. We show these events and compare the line ratios of 1340~1715Å which contain OI1356, NI1493 and LBH band. And we examine the FUV line-ratio verification to indicate the relativistic electron precipitating at the auroral region.