

AAS006-13

会場: 202

時間: 5月28日15:00-15:15

C/NOFS衛星及び地上観測網によって観測されたプラズマバブルの事例研究

Plasma bubble observed with the C/NOFS satellite and multiple ground-based diagnostics in Oct 2008

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Comparison of equatorial ionospheric disturbances observed with C/NOFS in-situ measurements and ground-based observations is performed on two days in Oct 2008. Electron density at 400-850km altitudes in the equatorial ionosphere is measured with a Planar Langmuir Probe (PLP) on the Communications/ Navigation Outage Forecast System (C/NOFS) satellite, which was launched in April 2008 in order to monitor and forecast ionospheric scintillation. In early October, 2008, the C/NOFS satellites flew over the American sector around the dip equator at the perigee altitude at dusk. On 5 Oct, strong 250MHz scintillation occurred at the Ancon SCINDA site without much electron density disturbance in C/NOFS measurements. On the other hand, on 10 Oct., lower scintillations were observed with severe electron density disturbance in C/NOFS data. On 5 Oct, the bottom-side irregularities did not reach the C/NOFS perigee altitude. Latitudinal total electron content (TEC) profiles obtained by Low-latitude Ionospheric Sensor Network (LISN) over South America shows smaller latitudinal gradient of TEC on 5 Oct. than on 10 Oct. The under developed Equatorial Ionization Anomaly (EIA) at dusk on 5 Oct can be an evidence of the absence of irregularity upwelling. The high TEC at the dip equator would enhance the scintillation level on 5 Oct. On 10 Oct, the upwelling of the irregularities was also observed by 50MHz radar backscatter observations at Jicamarca. Latitudinal TEC profile of LISN shows well-developed EIA. This allowed the irregularity bubbles to reach the C/NOFS perigee height. LISN-TEC also shows lower values around the equator, which could contribute to lower scintillation levels. Such day-to-day variability of irregularities remains an unresolved issue during solar minimum as well. We will try to understand this variability better by obtaining spectral measurements of high-resolution in-situ data to provide insight into plasma processes, optical and digisonde observations to provide information regarding the bottom-side of the F-region and using observed vertical drifts to model electron density profiles using the SAMI2 model for comparison with the TEC.

キーワード: プラズマバブル, C/NOFS衛星, シンチレーション, GPS受信機網, LISNネットワーク

Keywords: plasma bubble, C/NOFS, scintillation, ground-based GPS receivers, LISN network