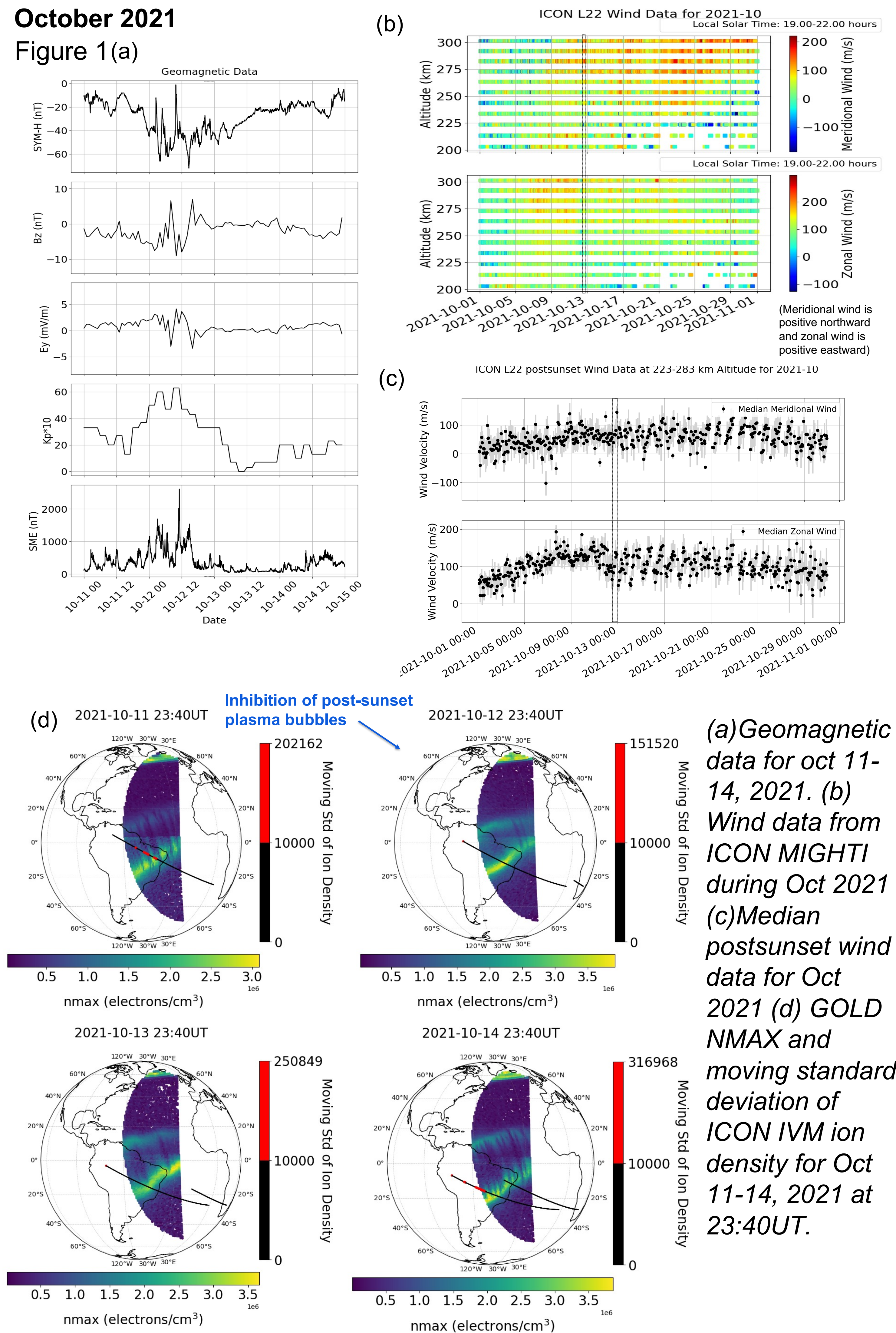


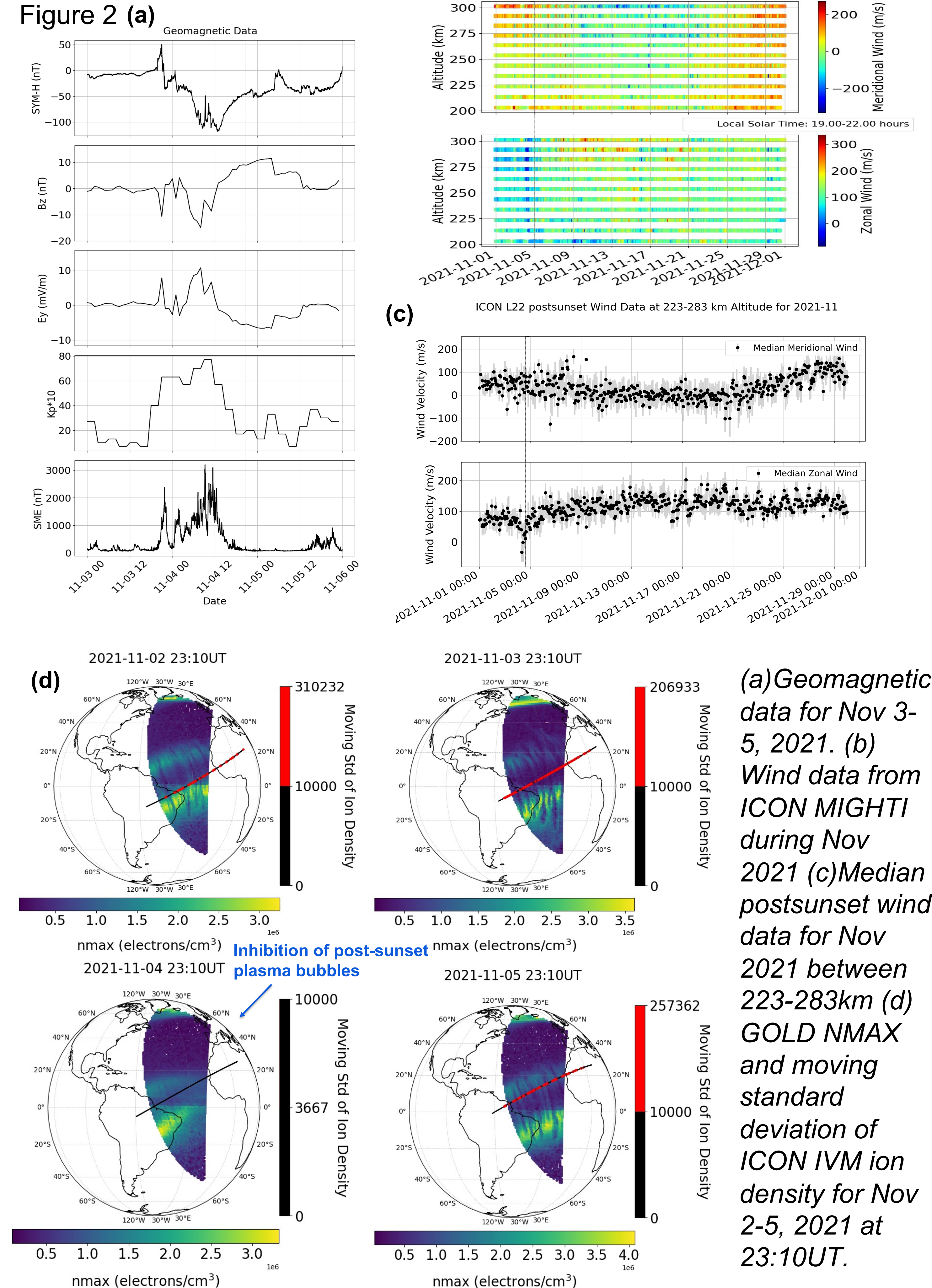
Abstract

The generation and development of ionospheric irregularities is an important topic of study in space weather, particularly due to their adverse effects on navigation positioning systems and trans-ionospheric communications. To improve our prediction capabilities, a comprehensive understanding of their variability during different geomagnetic conditions is important. **The purpose of this research is to analyze the inhibition of post-sunset plasma bubbles over South America during geomagnetic storms.** To conduct the analysis, we used the moving standard deviation (std), to characterize the occurrence of ionospheric irregularities in ICON IVM ion density data, $\text{std} \geq 10000$ indicates the presence of irregularities. We also used the peak electron density (NMAX) from GOLD night disk scan measurements to identify bubbles. Additionally, we consider ICON MIGHTI wind data (red line emission) to study the role of the neutral wind. We examine the presence of irregularities during three storms: October 12, 2021; November 3, 2021; and February 3, 2022.

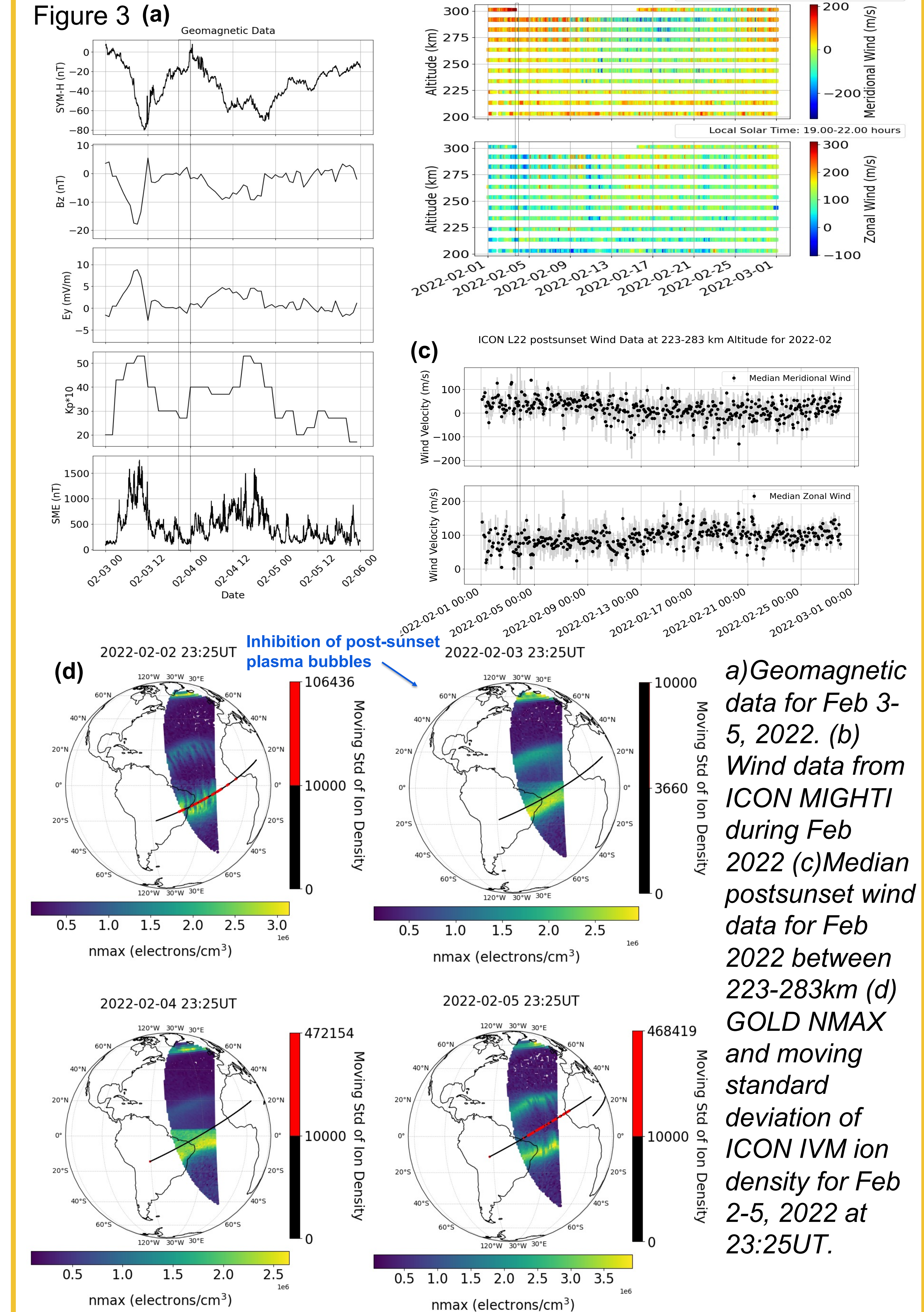
Observations



November 2021



February 2022



Plasma bubbles are usually observed at postsunset over the Brazilian sector, but on postsunset Oct 12 the bubbles were not detected (fig 1d). This was during the recovery phase of the geomagnetic storm occurred on Oct 12 (Fig 1a). Zonal wind (Fig 1b and c) turned eastward before the inhibition of the bubbles on Oct 12. The dotted lines indicate the period when the bubbles were inhibited.

This storm shows a similar effect; plasma bubbles over the Brazilian sector on Nov 2,3 and 5 but not on Nov 4 (fig 2d), during the recovery phase of the geomagnetic storm (Fig 2a). A strong westward zonal wind (Fig 2b and c) is observed before the inhibition of the bubbles. The same behavior is observed during the February 3, 2022 (Fig 3), geomagnetic storm, when the generation of plasma bubbles was suppressed during the recovery phase.

Summary

- **Post-sunset plasma bubbles over South America disappear during the recovery phases of the three storms analyzed.**
- Zonal wind in the F region turned westward before bubble inhibition occurs
- The DDEF might play an important role in the inhibition of the irregularities

Acknowledgement

The work is supported by the Ionospheric CONNECTION Explorer (ICON) project contract number NNG12FA45C and NNG12FA42I

REFERENCES

Abdu MA (2012) Equatorial spread F/plasma bubble irregularities under storm time disturbance electric fields. J Atmos Solar Terr Phys 75: 76-84-86
 Balsley BB, Haerendel G, Greenwald RA (1972) Equatorial spread F: recent observations and a new interpretation. J Geophys Res 77(28):5625-5628
 Blanc M, Richmond AD (1980) The ionospheric dynamo. J Geophys Res 85(9):1669-1686.

Huba JD, Krall J (2013) Impact of meridional winds on equatorial spread F: revisited. Geophys Res Lett 40(7):1268-1272.
 Martinis CR, Mendillo MJ, Aarons J (2005) Toward a synthesis of equatorial spread F onset and suppression during geomagnetic storms. J Geophys Res Space Phys 110(A7):1-12
 Senior C, Blanc M (1984) On the control of magnetospheric convection by the spatial distribution of ionospheric conductivities. J Geophys Res 89(A1):261-284.