

Whether sudden stratospheric warming effects are seen in the mid-latitude thermosphere of the opposite hemisphere?

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The reaction of mid-latitude daytime foF₂ and thermospheric parameters in two Hemispheres has been analyzed for a minor Arctic SSW in January 2008, three major Arctic SSWs in January 2006, 2009, 2013. Arctic SSWs always result in a synchronous simultaneously observed at some stations foF₂ depression in the Northern Hemisphere but not necessary in the opposite Hemisphere, i.e. not all SSWs have global appearance. Thermospheric parameters retrieved from ionospheric observations in two Hemispheres manifest a dependence on the type of SSW (major/minor) and its magnitude. Pronounced thermospheric SSW effects in the opposite (Southern) Hemisphere may be expected only for strong major Arctic SSW events. Retrieved exospheric temperature does not manifest any visible reaction to SSWs both for major and minor SSW events.

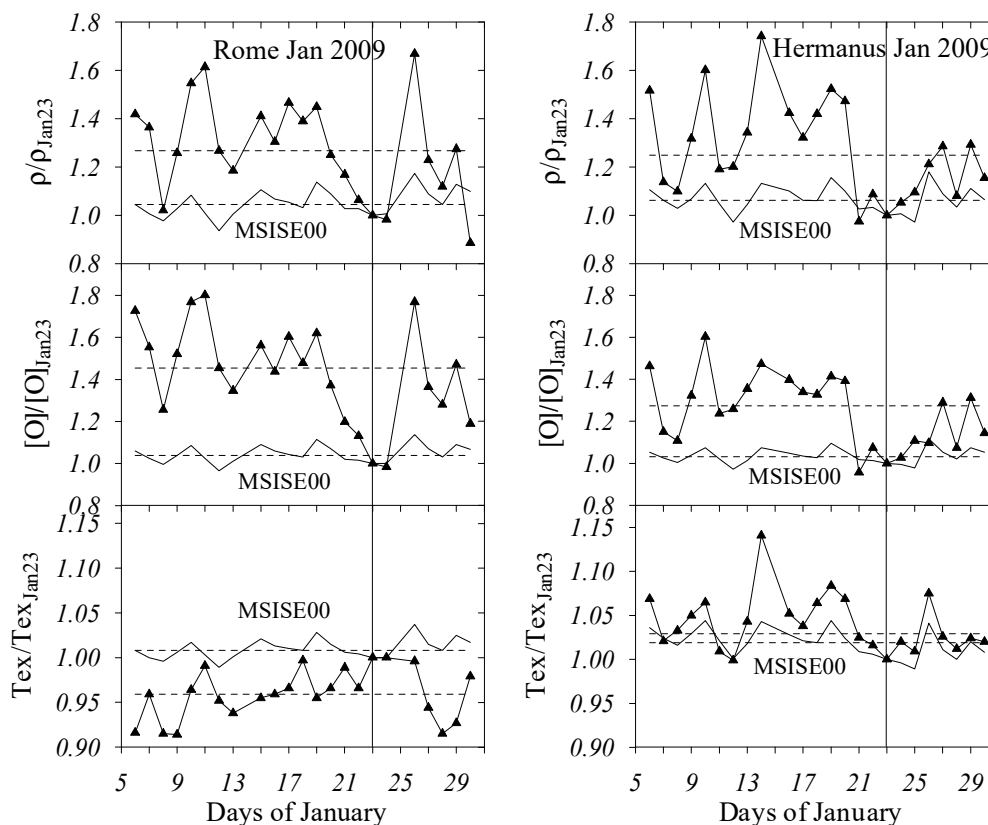


Figure 1. Observed neutral gas density p , atomic oxygen $[O]_{300}$, and exospheric temperature T_{ex} variations relative to January 23, 2009 values are given for Rome and Hermanus. Solid lines – MSISE00 model variations. Dashed lines - medians calculated over all points. Vertical solid lines indicate the date of SSW peak.

References

- [1] Mikhailov, A., Perrone, L., Nusinov, A. (2021), Mid-Latitude Daytime F₂-Layer Disturbance Mechanism under Extremely Low Solar and Geomagnetic Activity in 2008–2009, *Remote Sens.* 13, no. 8: 1514, *Impact Factor*(5yr): 5.4, <https://doi.org/10.3390/rs13081514>