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Annales Geophysicae Discussions

Interactive comment on "On the relative roles of dynamics and chemistry governing the abundance and diurnal variation of low latitude thermospheric nitric oxide" *by* David E. Siskind et al.

Anonymous Referee #3

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This work employs the TIME-GCM model in nudged and driven configurations together with various observational and observation-derived datasets to investigate equatorial lower thermospheric nitric oxide in terms of absolute magnitude and local time dependence. The novelty of the approach resides in the simultaneous comparison of observed and modeled key parameters ruling nitric oxide abundances, such as atomic oxygen and ionospheric parameters, allowing to test model implementations of chemical and dynamical processes at the base of the thermosphere.

The paper is well written and the topic is relevant for Annales Geophysicae. It certainly merits publications, subject to a few minor comments and suggestions listed below.

p 2 l16-19 SCIAMACHY on ENVISAT also measured thermosphere NO (Bender et al. 2013, www.atmos-meas-tech.net/6/2521/2013/). In this context it should also be noted that there are several recent empirical models of lower thermospheric NO from satellite observations with different local time sampling that might have been useful in addition to the employed NOEM model, e.g., the SANOMA model based on SMR data (Kiviranta et al, 2018, https://doi.org/10.5194/acp-18-13393-2018) or the SCIAMACHY-based model of Bender et al., ACPD, https://doi.org/10.5194/acp-2018-872).

p 3 l14 Figure 1 seems to display Kp rather than Ap. For instance, on 20 Jan 2010, Ap was 12 and Kp 2, the latter much better in line with the corresponding value of the dashed line in Fig. 1. The average Ap values quoted at l14 seem, however, to be correct.

Figure 9: The meteor radar data shown in panel (a) is not discussed in the body text.

Technical:

p 2 l10 mesospheric -> mesosphere

p 2 l27 1100 -> 11:00

p 8 l19 remove "by" before "the E-region"

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