Strode et al. developed in their study a global set of NO_2 and O_3 diurnal scaling factors accounting for the diurnal variability of NO_2 and O_3 concentrations in the atmosphere. The scaling factors were generated by using a 4D global atmospheric chemistry model, and are publicly available in dependence of solar zenith angle, latitude, and altitude. This work is relevant since the authors close a gap, which up to now do not allow an accurate comparison of different measurements (satellite vs satellite or satellite vs ground-based) of NO_2 and O_3 taken at different times of the day. The authors show, that the utilization of these scaling factors for comparisons (SAGE III/ISS, OSIRIS; MLS, OMPS and ACE-FTS) tremendously reduce the difference between the compared NO_2 and O_3 concentrations. Furthermore, Strode et al. could show that the interannual variability of NO_2 scaling factors is very likely to be correlated to the quasi-biennial oscillation (QBO). I recommend this paper to be published in Atmospheric Measurement Techniques, after the following minor points of criticism will have been addressed.

General remarks:

1) Consistently use NO_2 and O_3 OR nitrogen oxide and ozone. I would recommend to firstly mention nitrogen oxide (NO_2) and ozone (O_3) and the switch to only NO_2 and O_3.
2) For a better readability use consistent order of discussed trace gas in section 1, section 2.1.1, section 2.3 and figure 1. FIRST NO_2 and SECOND O_3.
3) Change the order of instruments in section 2.1 to be consistent with the order of mention later in the manuscript: SAGE, OSIRIS, ACE-FTS, MLS, OMPS LP
4) Please revise the reference section regarding missing doi or page numbers.

Specific remarks:

1) Title: Capitalize “Using”.
2) Line 41 – 54: Please mention the order of magnitude for both the NO_2 and O_3 diurnal variation/photochemistry to get an idea of the difference of both species.
3) Section 2: Underline difference between experimental data collection and simulation by using 2 sub-sections “2.1 Instruments and observation” and “2.2 Simulation and scaling factors” instead of 2.1-2.3. 2.2 can then be split up into “GEOS Model Simulation” and “Scaling Factor Calculation”.
4) Section 2.1: Better indicate whether the description regards O_3, NO_2 or both, especially for the used retrievals.
5) Line 151 – 169: Is the dynamical tendency of NO_2 neglected in the analysis due to the dominance of the chemistry? This is not clear here.
6) Line 188 – 191: For me the method is not clear here. Do you just take the best fitting data to compare model and observation and not the SZA=90° data? Is this admissible in this context? The “real” 90° value is unknown, isn’t it? Please clarify.
7) Line 221 – 230: Shift complete paragraph into the introduction or shorten it.
8) Line 237: “the O_3 peak” instead of “the peak O_3”.
9) Line 248: Change the section title. The result part already starts in section 3 with the model validation. Maybe “Data evaluation”.
10) Section 4.1.2: define the parameter “sunrise scale diff” as used in the figures.
11) Line 319: Change “SAGE III/ISS sunrise (SR) and sunset (SS) NO_2 and OSIRIS and ACE320 FTS observations” to “SAGE III/ISS sunrise (SR) and sunset (SS) and OSIRIS and ACE320 FTS NO_2 observations”.
12) Line 365 – 381: It would be helpful to note the difference in magnitude of the scale factors when comparing O_3 and NO_2.

13) Figure 8: Colors of legend and data are not the same.
14) Figure 9: Suggest to use a wider y-axis-range.
15) Figure S4: Mention that the shown data is NO_2 data.
16) Figure S5: SZA=60 → SZA=60° (unit missing)