

Interactive comment on “Intercomparison of measurements of NO₂ concentrations in the atmosphere simulation chamber SAPHIR during the NO₃Comp campaign” by H. Fuchs et al.

Anonymous Referee #2

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This manuscript reports the results of an NO₂ instrument comparison which took place on the SAPHIR chamber. The comparison included state of the art techniques as well as standard commercially available methods based on absorption, fluorescence, and photolysis-chemiluminescence. The paper is well organized and adequately addresses the key performance metrics while providing insights into minor discrepancies that were observed. The important result of this paper is that for all instruments, if they can calibrate often, e.g. hourly, to NO₂ standards and/or critical instrumental parameters (Io or mirror reflectivity), we can have extremely high confidence in NO₂ measurements made across instrument types and timescales down to the ~ 100 ppt level.

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The paper provides important knowledge of the factors that must be addressed for accurate and precise measurements in field situations for each instrument type –i.e. accurate cross-checked standards and diligent monitoring of sources of imprecision. The material is entirely appropriate for AMT and thus, I recommend publication. I have only minor comments that the authors might consider.

pg. 2544 line 7, "This interference..." presumably the percent interference of HONO in an NO₂ measurement depends on the ratio of HONO/NO₂ in ambient air. The ratio used for this calculation could be specified here.

pg 2559 line 9, "...within the range of several ppb's" add the percent deviation

pg. 2560 line 27, change "was" to "were"

pg. 2564 lines 9 - 13. This section is confusing. Line 10 change "smaller" to "lower" or "worse". Line 12 change "observed increase" to "this discrepancy" or "this difference" or "the difference in precision between the two versions"

Figure 5. The authors might consider log-log axes for each panel allowing readers to more easily discern the overall range of NO₂ concentrations used during the experiments.

Interactive comment on Atmos. Meas. Tech. Discuss., 2, 2539, 2009.

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