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Interactive comment on "Measurements of total odd nitrogen (NO_y) aboard MOZAIC in-service aircraft: instrument design, operation and performance" *by* A. Volz-Thomas et al.

Anonymous Referee #1

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Review of manuscript No. acpd-2004-0142: Volz-Thomas et al., Measurements of total odd nitrogen (NOy) aboard MOZAIC in-service aircraft: instrument design, operation and performance

This is a very nice paper describing a new compact airborne NOy instrument for unattended operation on an in-service aircraft. The paper presents a lot of details about the instrument design, a thorough laboratory characterization of the instrument's sensitivity, time resolution and potential interferences as well as some measurement verifications of its in-flight performance. Such a detailed characterization is important in terms

of quality assurance of the large NOy data set expected to be gained during MOZAIC flights in the coming years. I therefore recommend publication after the following revisions, most minor, are made.

In table 1 the time resolution is specified as 0.1 sec for NOx and 20 s for HNO3, while Fig. 10 indicates a time resolution of 1 sec and 150 sec for NO2 and HNO3, respectively. Also, based on a reaction chamber volume of 30 ml, operated at 10 hPa and a flow of 100 sccm a residence time of 0.2 sec can be deduced that is not in line with the 0.1 sec stated in Table 1.

In Figure 1 the symbol for the vacuum pump shows in the wrong direction. Additionally, the pre-reaction volume of 25 ml seems to be at odds with the numbers given on page 6153, line 19 (length: 35 cm; inner diameter: 6 mm).

Conversion efficiency and interferences: Did you also check interferences to CH3CN, which can have significant mixing ratios (50 - 300 pptv) in particular in biomass burning plumes, and to N2O?

Comparison to an externally mounted Au-converter: To what extent can the 15% shortage be explained by the different sampling geometries, with the external converter sampling approx. 20 cm away from the aircraft fuselage, most probably outside of the aircraft boundary layer, while the Rosemount used for sampling of the MOZAIC instrument is much closer to the fuselage, probably inside the boundary layer?

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 6149, 2004.