

Interactive comment on “An aircraft-borne chemical ionization – ion trap mass spectrometer (CI-ITMS) for fast PAN and PPN measurements” by A. Roiger et al.

Anonymous Referee #1

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The paper describes a newly developed chemical mass spectrometer for the measurement of PAN and PPN onboard aircraft. Among a detailed description of the instrument, some data collected during the POLARCAT-GRACE campaign are presented and discussed.

I must say that the present manuscript constitutes the most carefully and straightforward paper I ever had to review. Besides very minor comments, I actually have nothing to criticize. Thus, I strongly recommend quick publication.

Minor concerns

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p.4313, l.12: add “total” before uncertainty

p.4315, l.3: “. . . and plant damage.” add citation.

p.4316, l.15: “. . . attached water molecules”. I understood what you mean, but specify to “. . . water molecules attached to . . .”.

p.4319, l.5: “. . . a hot metal tube”. What metal?

p.4320, l.11: “. . . to hydrated I-(H₂O)_n cluster ions”.

p.4324: Section 2.4. Maybe I haven’t seen it, but I only found the isotopic cali-bration for mass 59, that is PAN (equation 1), but not for PPN or MPAN. Moreover, it would be very nice to see how strongly the sensitivity changes along a flight (a figure would help) and what the main drivers for the relevant changes are.

p.4328: Section 3.4. You usually give the signal in “peak heights / arbitrary units”. This is uncommon, right? Usually counts per seconds are given. Then you can give the sensitivity in cps ppbv-1 and the background in cps. Then the reader has the chance to follow your estimation on the accuracy, precision, and detection limit. I strongly recommend improv-ing section 3.4 and the figures in this respect.

p.4334, l.1: “The observed water vapour dependency is accounted for by the on-line calibration”. That is, you “only” apply the isotopic calibration, which partly or even largely reflect the H₂O dependence, right? Can the com-bination of the isotope-calibration derived sensitivity, the laboratory-measured H₂O dependency (figure 6) and H₂O data from a hygrometer onboard be used to retrieve a calibration for PPN?

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 4313, 2010.

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