

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 in-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

C2135

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 calibration 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 improving 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 combination 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?

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