

***Interactive comment on “Technical note:  
Detection of dimethylamine in the low pptv range  
using nitrate Chemical Ionization-Atmospheric  
Pressure interface-Time Of Flight (CI-APi-TOF)  
mass spectrometry” by M. Simon et al.***

**Anonymous Referee #1**

Received and published: 13 January 2016

This work describes the use of  $\text{NO}_3^-$ -( $\text{HNO}_3$ )<sub>n</sub> chemical ionization mass spectrometry (CIMS) for the detection of gas-phase dimethylamine (DMA) with detection limits in the low pptv range from the CLOUD nucleation chamber at CERN. The detection of amines in the atmosphere has importance as these molecules are thought to participate in particle nucleation due to their inherent basicity. The paper is logical, well-written, and appropriate for publication in AMT, which I recommend after the following, mostly cosmetic, comments have been considered.

Working from the 'printer friendly version'.

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Recommend removing 'Technical note:' from the title, unless the authors are truly attached to this.

P13259 L2: may be useful suppose here that atmospheric concentrations of amines are low, and thus motivating the statement that 'highly sensitive' measurements are needed.

P13260 L5,L9; P13261 L1: These sentences may read better with the removal of the word 'already'.

P13267 L18-20: Please clarify that the sum of these two DMA cluster ions are used in figs 3-6.

P13268 L24-25: a 10% uncertainty in the accuracy of the MFC seems a bit high if the range of the MFCs is matched to their use. Generally, when calibrated by the manufacturer these have accuracy of at least 1% or better of the full scale value.

P13269: Fig. 5 appears to be discussed before Fig. 4. Suggest swapping the numbering of these figures.

P13269: A change of  $\sim 2.3$  in the sensitivity factor seems large if the ionization configuration (flows, pressures, interaction time, etc) has not changed. Can the authors discuss in more detail what may be the cause of this? Generally, we do not observe significant shifts in CIMS sensitivity so long as the configuration remains the same. I do note that it is interesting that the inferred ratio of transmission factors between these experiments (0.6) is in the opposite direction, and if assumed equal would cancel out a large fraction of the sensitivity difference. Have the authors done the simple inlet length test to verify the inferred transmission factors (e.g. inlet lengths of 1, 2, 4m)?

P13270 L24-25: perhaps better as '...can be drawn, reduced line losses may be realized.'

P13271 L22: perhaps better as 'Applying the correction factor increases these values correspondingly'

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Figures 2-6: The readability of these figures is not to good in the AMTD version, and I fear it will be even worse as the AMT if they are displayed as single column figures. Suggest increasing the font-size of all text and tick-lengths by at least a factor of 2.

The paper ends by with a few statements about the agreement of the CIMS DMA measurements with the IC observations, and conclude that the agreement is good. I would suggest that the authors should delve into this a bit more. What is the detection limit and accuracy for the IC? Does the 1-1 regression of the observations yield parameters that are consistent with the detection limits and accuracy uncertainties for of the instruments?

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Interactive comment on Atmos. Meas. Tech. Discuss., 8, 13257, 2015.

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