

Interactive comment on “Performance evaluation of a high-resolution parallel-plate differential mobility analyzer” by J. P. Santos et al.

Anonymous Referee #2

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The paper is clear and easy to read, describing a new high-resolution DMA.

In the text following Eq. (23) on page 17642, α is described as the angle formed between the deterministic trajectory and the "x-axis" which is parallel to the flow. This may be merely a typo but it should be the y-axis. This would then conform to the last factor in Eq. (24).

Two factors have been omitted from Eq. (25) on page 17643. The first is $Q_{sh}/(Q_{sh}+Q_a)$ deriving from the Q_{sh} in the definition of k_c (Eq. (14)) and the fact that \bar{u}_x depends on the total flow $Q_{sh}+Q_a$. The second omitted factor is $(\Delta x^2 + \Delta y^2)/(2 \cdot \Delta x^2)$. This factor is 1 in the current configuration and the first is very near one for a high resolution instrument. Thus, it is justified to omit these factors for the current configuration

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but that should be noted.

In Fig. (1) the ion inlet is downstream of the ion outlet. What are the inner lines along the direction of flow? If they are streamlines then please make them dotted or thinner to distinguish them from the instrument outline.

On page 17633 references should be given for the works of Zeleny and Langevin. On page 17644 in the text following Eq. (29) it should be noted that turbulence in the flow at the inlet or outlet slit is a very important nonideality affecting DMA resolution. Also, the slit width affects the DMA accuracy, not the resolution. On the same page line 19 the range of the sheath flow rate should be given as 200 to 700 l/min according to Table 1. On page 17646 line 14 should the disk be 0.5mm in diameter? Otherwise it would not fit in the 4mm ID tube. The last line of that paragraph appears to be redundant.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 17631, 2008.

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