

Interactive comment on “Single particle characterization using a light scattering module coupled to a time-of-flight aerosol mass spectrometer” by E. S. Cross et al.

Anonymous Referee #3

Received and published: 3 February 2009

This paper contains important results from a "new" instrument on Mexico City particles and instrument performance. The paper is from an established, accomplished, and well-funded group, and the paper is led by a promising young scientist. It has important results, some of which are appropriate for ACP and could be acceptable for publication. The field data (from the limited information provided) are interesting and merit more analysis, especially with respect to single particle composition. In its current format, the manuscript does not do justice to either the advancement in instrumentation being presented or to the new measurements acquired by the LS-AMS. In summary, I do not see any way in which publication would be appropriate without a major rewrite, omitting technological details (or moving them to an appendix) and unsupported speculations

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while including all figures with stated uncertainties.

1. In its entirety, it reads a bit like a thesis – a reflective look at a somewhat disjointed body of work. While it is laudable to avoid the temptation to maximize the number of publications, the conflict between technological details and significant atmospheric measurements in a very lengthy paper will no doubt limit its influence on the ACP community by burying the atmospheric implications amidst a plethora of details about sampling modes and duty cycles. I strongly suggest dividing the paper into two separate manuscripts (the second aimed at an instrument/technology journal and audience), and retain only the significant atmospheric results here. That re-organization should also allow a more comprehensive defense of each part, as will be needed to address some of the posted comments. Much of the length is associated with informal discussions and speculation, which really are not appropriate for a journal with high standards. 2. The paper identifies important uncertainties and/or corrections needed to interpret AMS data quantitatively. However, in the data interpretation about Mexico City, there is absolutely no attempt to show how those uncertainties affect the results, and there is no attempt to address the way in which the uncertainties will impact the speculations that are drawn about work by other groups. It is almost as if the authors have ignored the findings of the first half of their work in presenting the conclusions of the second half.

21316, Lines 22-28: Typically a useful literature discussion states the relevant findings from the work, rather than simply providing a list of papers. The former can be both more substantive and relevant, even at the expense of fewer (more important) citations. 21317, lines 1-2: same comment. 21317 line 2: "we do not use double parentheses" should be omitted 21321, lines 1-9: This is one example of a digression into a technical “mine is better than yours” fight, which is certainly not enhanced by the personal reference to “Moffett” as opposed to the relevant multi-authored publication ("Moffett et al., 200x"). This tone is inappropriate, and Referee 2 has already (rightly) taken issue with it. I’d prefer to avoid such discussions in

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the absence of an actual side-by-side comparison of each instrument's strengths and weaknesses (which has not been done here – but would make a much better paper). Let’s try to be “gentlemen” and save these assertions for a fair fight. An attitude that strives to identify all of the useful information in complementary techniques is much more likely to provide a lasting advance in the field. 21328: is the collection efficiency found here consistent with 0.5? or not? What are the error bars on this measurement? Is it +/-1% as implied? Everywhere, or just at T0 in April? 21342: While the absolute magnitude of biomass burning sources may not be adequately represented in the current data set, our single particle measurements indicate that biomass burning was a relatively minor source for particulate matter at T1 during the sampling period under discussion. WHY?

21346: This page sounds like a proposal not a paper. How is it relevant to your results? Or omit. 21348, line 1-2: what implies what? The evidence of a trend should be presented as a scatter plot with a quantified value of correlation. 21354-5: The assertion about Pb’s lesser importance seems difficult in the absence of evidence that Pb particles don’t result in null counts. That basic problem negates the relevance of the next 2 pages of discussion. 21356-7: The bullet point format seems inappropriate for a formal journal publication.

Fig. 11 is missing. Fig. 10 is difficult to interpret and has a number of overlapping lines/labels.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 21313, 2008.

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