Atmos. Meas. Tech. Discuss., 6, C4205–C4207, 2014
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Atmospheric Measurement Techniques Discussions



# *Interactive comment on* "A concept of an automated function control for ambient aerosol measurements using mobility particle size spectrometers" *by* A. Schladitz et al.

**Anonymous Referee #2**

Received and published: 31 January 2014

The manuscript presents a function control for SMPS measurements of ambient aerosol. While the basic concept (SMPS vs stand-alone CPC) is certainly not new, the implementation seems simple enough for routine applications within larger networks.

However, the article seems terribly short and leaves some significant questions unanswered.

1. The 20nm cut-off is a problem, as referee #1 pointed out already. However, I do understand that it is not feasible to include sub-20nm in the quality control. But you do lose a lot of information. And the quality control will necessarily miss the onset of



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problems in the SMPS setup which are likely to occur first in the smaller sizes. To mitigate these issues to a degree, I wonder if it would be possible to extend the setup in such a way that the transfer CPC and the SMPS-CPC both measure total aerosol for a while during each control cycle. That would at least ensure CPC operation and increase confidence in sub-20nm SMPS data. It would also be possible to measure total aerosol during each SMPS cycle (with the SMPS CPC) and thus have a continuous indicator of operational quality. During nighttime, there is typically little activity in the small size ranges, and one would essentially expect similar values for SUM(SMPS) and CPC_total. All without diffusion screens. Of course it would also be possible to let the system run with screens for an hour each night. Only the CPC calibration would need to be checked every now and then, and no transfer CPC would be needed. In short, what I'd like to see is some discussion as to why the presented setup is indeed the best option we have. What are the downsides of possible alternatives? It's a rather short manuscript, so I think it should at least cover all bases.

2. Table 1 - what exactly is the point?

3. Fig. 3 seems rather useless. What is the information it is supposed to provide?

4. Fig. 4: Wouldn't it be nice to see the same thing WITH diffusion screens? The screens play kind of a central role, and they should be characterized properly from different angles.

5. Fig. 5: Are there any alternatives to cut the smallest particles away? Why are diffusion screens the best option? One seems to lose rather a lot of bigger particles, too.

6. Fig. 6: It doesn't show "a full year", does it? The text states that "variability can be seen from cycle to cycle, which cannot be fully explained at present". I'd really like to see a hypothesis or two discussed. Has the shape of the PNSD any influence? Meteorological conditions? The periods in November and March show a very clear and opposite drift. What's up with that? You state that the function control doesn't work for



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fast changes in PNSD. How does this figure look like when you take only situations into account when the PNSD doesn't change too quickly (nighttime, no wind)?

Summary: You must have lotsa data, but you show precious little of it. Some more discussion of the choices you made and of the results you gained.

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Interactive comment on Atmos. Meas. Tech. Discuss., 6, 10551, 2013.