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Atmospheric Measurement Techniques Discussions

Interactive comment on "Characterization of a new fast mixing type CPC and its application for atmospheric particle measurements" *by* B. Wehner et al.

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Comments on B. Wehner et al. "Characterization of a new fast mixing type CPC and its application for atmospheric particle measurements"

The paper describes the design and performance characteristics of a new fast mixing type CPC, FCPC, designed for application on board of measurement aircraft. The paper is clear, well structured and written. Reasons for constructing and evaluating the FCPC are properly stated, experiments are well described and performed and results are reported in a clear and concise way. I have no objections to publication the paper

as is. Below, however, are my few comments that authors can consider if they find them useful.

-In abstract you could mention the working fluid used in the FCPC.

-p.5910, l.18-20. We have been running a mixing type CPC continuously over time range of months in atmospheric conditions. Some of the first results are published by Vanhanen et al., AS&T 45:4, 533-542, 2011.

- Swagelok-T is used as a mixer. It's heat conductivity is quite high and the mixing is not possibly very adiabatic. Thus the working fluid would not necessarily supersaturate in the mixing process but only in the conderser. It probably does not deteriorate instruments operation in this case, but only the idea of activation by adiabatic mixing. Also, the aerosol flow is not temperature controlled, and thus the only reasonable operation mode in ambient measurements would be such that activation takes place in condenser.

-What is the length of the condenser tube? Flow is quite high so to effectively use the vapour for growing the particles it should be reasonably long.

-p.5914, l.16 & p.5915, l.12. Is it meaningful to give std in absolute numbers as the deviation must be concentration dependent? Maybe rather std of normalized difference?

-What is the maximum concentration that FCPC can reliably measure, and what kind of processing (for accounting e.g. coincidence) is needed? In fig 6 it seems that $\sim$8e4 is quite abundant concentration. Is it real or can it be related to any saturation problem in droplet counting?

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 5907, 2010.