Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2015-332-RC2, 2016

Atmospheric Measurement Techniques Discussions

Interactive comment on "Sampling strategies and post-processing methods for increasing the time resolution of organic aerosol measurements requiring long sample collection times" *by* R. L. Modini and S. Takahama

Anonymous Referee #2

Received and published: 4 March 2016

Increasing the time resolution after staggered sampling of long-time samples using mathematical methods is a well-known but experimentally not practicable method for highest analytical challenges of environmental samples over long field experiment durations. The selected example of 220 hours is a "no go" for staggered sampling because the high number of samplers needed and the enormous costs for analyses of the high number of samples. Often measurement campaign have a much longer duration so staggered sampling can be used only in very few cases. Therefore I recommend to shorten the discussion of the staggered sampling in favor of sequential sampling. Sequential sampling is a much better possibility in view of the experiment costs how the

authors have shown in Fig. 9 and discussed at some different places elsewhere. After my opinion, the applicability of this method is limited to such regimes like the selected one with clear and distinct daily variations. For a remote sampling site with low differences of concentrations between day and night or a sampling strongly influenced by meteorological changes and rapid changes in emission strength of specific sources this method seems to be unsuitable. The here discussed and properly described method is for my eyes as an experimentally working field chemist not more than an interesting mathematical play! When the analytical method doesn′t allow to take hourly samples than you have to accept it or you must search for an improvement of the analytical method or apply another one. Nevertheless, the calculations have shown that staggered or sequential sampling and the applied model can improve the time resolution of an experimental data set under specific conditions with acceptable low errors but I′m not sure if the method is applicable for another place with more complex influences.

Specific and technical comments: p.3 l.26: Please be careful with such statements – I don′t know one work which has done a full (100%) characterization of the OA. p.9 l.1: Only a Fig. 3 is existing, please rewrite this sentence! The x-axis at Fig. 3 should be renamed because there is no date. p.14 l.1: "Filter sample length" you cannot use instead of sampling time, sampling period or sampling duration. p.14 l. 17-21: These are two very important sentences! For a real experiment you don′t have the possibility to recalculate an optimal starting time you have to decide it before the collection starts. Based on experiences you can try to optimize the starting point but here I have to recapitulate that staggered sampling is in most cases experimentally not practicable and too expensive as well. p.15 l.5: You discuss here OOA and HOA but not aerosol mass – these are different things. p.15 l. 29 and p.18 l.23 Please, use only one language for dependance! p.25 l.17. In the figure caption Fig. 11 it is correctly described that 4 h samples were discussed but here in the text it should be added, too.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2015-332, 2016.