Review of

« The filter loading effect by ambient aerosols in filter absorption photometers depends on the mixing state of the sampled particles », by L. Drinovec et al.

Main comments:

-The filter absorption photometers suffer from several artifacts and the filter loading effect is only one of them. The other artifacts and principally the multiple scattering effect that have the greatest impact on the calibration of the instruments have at least to be mentioned in the abstract and described in the introduction. Moreover, if a comparison with a non-filter based instrument or at least a MAAP during the Ljubljana campaign with drying and denuder, it would allow to gain extremely useful information on the dependence of the multiple scattering effect on the coating of the particles.

- to my knowledge, there is no dependency of the AAE to the aerosol size (or size distribution). I think that there is a mismatch in the paper between the AAE and the scattering Angström exponent that really depends on the aerosol size (for ex P. 12 lines324-325, conclusion lines 528-530).

- Instead of using k6 for a large part of your study, wouldn't it be better to calculated the k Angström exponent that is the wavelength dependence of k ? Do you have an explanation why the size distribution and the coating have such a large impact on the wavelength dependence of k ?

- Fig. 8: If I do agree with the linear correlation between k6 and CF for both summer campaigns, the winter campaigns both in Paris and in Payerne cannot be fitted by a lineal and the decrease of k6 with CF is not clear. Is there difference in the chemistry of the coating as a function of temperature explaining this difference? Sentence lines 384 should be consequently changed as well as p. 16 lines 393-395.

Minor comments:

- It is not usual to have a complete sentence as a title, but this is ok for me
- A brief paragraph with a very succinct description of the study should be added at the end of the introduction.
- P, 4 line 103: I think that the present should be used.
- P. 4 lines 105 and 121: the flow is first said to be different for each spots and then (121) a unique flow rate of 5 lpm is given.
- P. 5 line 148: above sea level == a.s.l.
- P. 6 line 203: why did you chose 500 a.g.l. for the trajectory end and not the surface ? Is it possible that the stable boundary layer during the night is lower than 500 m a.g.l. ?
- - Fig. 1 & 4: it seems that there is a change in the wavelength dependence at 660 nm. Do you have an explanation for this phenomena found at least in 4 of the fingerprints of Fig. 1 ?
- P. 98 line 240: " Occurrence of higher k values appears to be linked to the latter parameter" : do you speak of the k values at 880 or 950 nm that are linked to the absorption Angström exponent ? This seems to be right for the laboratory and winter campaign data, but not for the summer campaign (see also next figure).
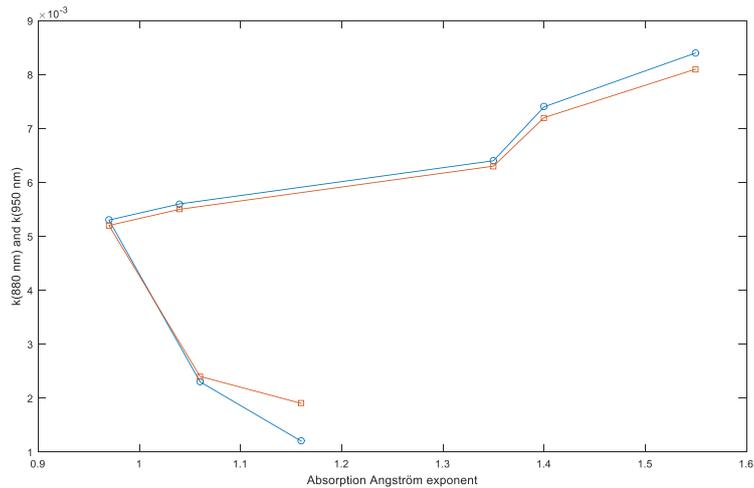
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- P. 10 line 277 and Table 2: a figure (see thereafter) seems much more appropriate than a table to see the correlation between AAE and k6. Looking at the figure, I do not understand why you say that April, May and October (with a red circles) are exceptions. I'm aware that I did not report the errors on the figure, but the correlation seems otherwise to be ok.
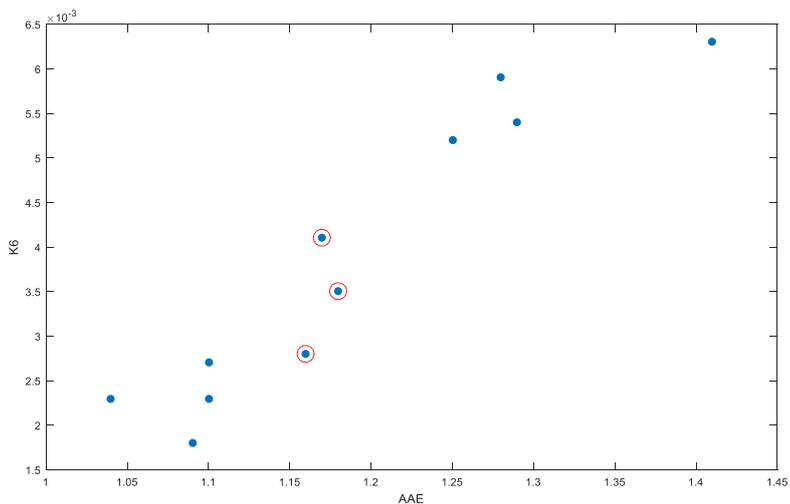
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- P. 11 line 289: k6 decreases with AAE for AAE>1.2. For AAE<1.2, it is not sure.
- P.14 lines 361-369: can the observed time lag between k6 and CF be also due to the time taken by the gaseous species to coat the aerosol particles ?
- P.17 lines 416-418:please rephrase! The fact that the PBL is thicker in summer than in winter is obvious and does not need a reference. The fact that there is a stronger influence of long-range transport than in winter is not obvious at all and should be referenced. The end of the sentence is somewhat curious.
- P.17 line 420 and 421: k6 instead of k?
- Figure 9 + explanation in text: the number of cases for k2 lower and higher than 0.002 is not mentioned. In case of a large difference of cases, the seen effects could be only due to the amount of data. Since no figures for low BC and CF concentrations are given, it is also not possible to be sure that the pattern would be clearly different than the ones for high BC and CF concentrations. For Payerne, the differences for low and high k6 are not obvious. Moreover, I'm not convinced by the term "regional" asking myself if great-Britain and the Atlantic ocean can be considered as in the region of Paris.

- P.17 line 422-424: I think that the causality link is just inverse: the trajectories explain the presence of coating material.
- Fig. 10: to which kind of sample corresponds image C? I do not see the white arrows described in the text.
- Fig. 11 b is not necessary.
- P. 21 last §: why the soot particles begin to age by developing a coating immediately after sunrise ? Is it an effect of solar radiation? Or an effect of concentration of soot particles and secondary species (and their relative content) ? how do you explain the k6 diurnal cycle of ambient aerosol? Is the concentration of secondary species larger in the end of the afternoon? How do you explain the increase of the diurnal cycle after drying ?
- P. 22 lines 528-530 see major comments
- P. 22 lines 534: the main effect of the coating effect and therefore of the difference between summer and winter measurements is to my point of view not the reduction of the filter loading effect (not much is visible at 350 nm) but the modification of the k wavelength dependence.