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Atmospheric Measurement Techniques Discussions

Interactive comment on "Autofluorescence of atmospheric bioaerosols – spectral fingerprints and taxonomic trends of native pollen" *by* C. Pöhlker et al.

Anonymous Referee #1

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General comments:

This is a well written and very timely study. The authors give an insight to the recent literature about pollen and construct their motivation around the given information. The results are very interesting and may lead to the development of rapid detection of pollen by ultraviolet light induced fluorescence method. As the authors state in the manuscript this study follows the part I paper by Pöhlker et al. (AMT, 2012). I strongly recommend publication in AMT after some minor revisions.

Specific comments:

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- Concerning the presentation of the results I would like to call your attention to the paragraph between L381 and L390 where you summarize the findings from fluorescence microscopy analysis. The entire paragraph provides a nice conclusion of results from fluorescence microscopy part of the study. However in the following paragraph the same results are discussed in detail and it is difficult to see that the same numbers refer to the same topic of discussion. Therefore I would suggest rearranging this part to make it easy for reader.

- One of the most important observations in this study is that the relative fluorescence emission intensities of the same species show significant variation. Do you have any evidence that this behavior of pollen may be related to the metabolic state of pollen? Did you apply any viability test to the pollen species you presented?

- In the fluorescence microscopy section you suggest that the single particle fluorescence may substantially differ from bulk fluorescence of same material. What kind of uncertainties would this difference introduce in the case of use of light induced fluorescence (LIF) technique for online pollen detection?

- L78: According to the study which authors reference here pollen can swell and burst after taking up water. This causes a release of significant amounts of micrometer size fragments of cytoplasmic debris. Nevertheless, it is not entirely clear to me why the number concentration of small PBAP could be underestimated in such case? Since authors suggest that the pollen wall provides the key information for detection and differentiation from other bioaerosol candidates it should be still possible to detect the pollen; regardless of the swelling process.

- L316: Can you describe briefly why you normalized the mode intensities to the total intensity and how you chose input data for PCA?

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 5693, 2013.