

Interactive comment on “Fluorescent biological aerosol particle concentrations and size distributions measured with an ultraviolet aerodynamic particle sizer (UV-APS) in Central Europe” by J. A. Huffman et al.

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Reviewer 2 Comments:

RC 2.0

This manuscript describes a new set of online fluorescent biological aerosol particle (FBAP) observations taken over several months in Mainz, Germany using the UV-APS instrument. The current record of PBAP measurements is sparse, and therefore these observations are clearly valuable for characterizing the variability and contribution of PBAP to ambient aerosol. While the value of this unique dataset is clear, the pre-

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sentation of these results in this manuscript needs some improvement. The authors' discussion of results is often excessive (examples given below), as is the description of certain rudimentary data collection tasks. Insight into the processes controlling the observed concentrations could have been provided by a more in depth analysis (the authors' indicate that further statistical analysis is forthcoming) or ancillary datasets. As the authors have chosen not to do so here, I suggest that for publication in ACP, the presentation of results should be substantially abbreviated.

[Author Response, AR 2.0] The authors thank the reviewer for his/her positive assessment stating that “these observations are clearly valuable for characterizing the variability and contribution of PBAP to ambient aerosol.” The critical comments have been constructive for producing a manuscript of higher quality, and individual comments are addressed individually below.

[RC 2.1] Major Comments

[RC 2.1.1] 1. Throughout the text the authors include excessive details which should be removed from the text (or moved to supplementary materials). I include some examples here:

[RC 2.1.a] a. Listing file formats (page 17711, line 17 and page 17713, line 16)

[AR 2.1.a] [These have been moved to the supplemental online material.](#)

b. Providing room locations for sampling (page 17711, line 28)

[AR 2.1.b] [This has been moved to the supplemental online material.](#)

c. Experimental details that are not critical (page 17712, lines 10-23 could be summarized in one sentence)

[AR 2.1.c] [Lines 18-23 \(starting with “Additionally ...”\) have been removed. The](#)

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remaining details in Section 2.2 (L 9 – 18), however, are useful both for evaluating the quality of this experiment and for informing the design of further experiments at other locations.

d. Software information for collection and analysis is irrelevant (page 17713, line 15-22)

[AR 2.1.d] All of Section 2.3.1 (P 17712 L25 – P17713 L22) will be moved to the supplementary online material (SOM), reducing the manuscript by 280 words.

e. Detailed discussion of detection limits (Section 2.4) should be summarized.

[AR 2.1.e] Again, all of Section 2.3.1 (P 17715 L18 – P17716 L14) will be moved to the supplementary online material (SOM), reducing the manuscript by 319 words.

f. The discussion of results in Section 3 could be substantially abbreviated.

[AR 2.1.f] As discussed in response to Reviewer 1, this section will be substantially abbreviated as suggested (by 509 and 197 words in sections 3.1.1 and 3.1.2, respectively). See *AR 1.3* for more details.

[RC 2.2] 2. Several figures could be eliminated (Figure 1 and 4) as they provide redundant information, or merged together (Figure 9, 10, 11). In the case of this last I would recommend removing the diurnal panels as not all these exemplary periods were of similar duration, and the exemplary nature of the sampling is driven by the size distributions, not the temporal variability.

[AR 2.2] As suggested, Figures 1 and 4 have been moved to the online supplemental material to reduce redundancy and improve clarity. We disagree, however, with removing the time series parts of the panels from Figures 9 – 11. For several of the exemplary size distributions, the temporal variability or stability of the peak(s) are

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important aspects of the information that makes the events unique. Removing these halves of the panels, therefore, will reduce the message conveyed. We chose to keep Figures 9 – 11 from being merged, because we felt that a twelve panel figure would have been too small for final publication.

[RC 2.3] 3. Section 3.1.2: Rather than listing all the dates of elevated mass concentrations throughout the entire campaign, it would be helpful to indicate how many events matched the number concentrations peaks and if there were additional events where only mass concentrations peaked.

[AR 2.3] Again, as suggested the text in Section 3.1.2 has been substantially shortened and clarified.

[RC 2.4] 4. Units on size distributions should be corrected. The correct units of dN/dD are $\text{cm}^{-3}\mu\text{m}^{-1}$, the units for dM/dD should be $\text{ugm}^{-3}\mu\text{m}^{-1}$ (see Seinfeld and Pandis equation 8.3 and figure 8.4). If these values have not been normalized for size then they should be reported as N and M.

[AR 2.4] The reviewer suggests that units for all number and mass size distributions shown and discussed in the manuscript be changed to $\text{cm}^{-3}\mu\text{m}^{-1}$ and $\text{ugm}^{-3}\mu\text{m}^{-1}$, respectively. However, we use logarithmically scaled distributions in which the diameter units cancel out. Please note that Equation 8.3 and Figure 8.4 refer to non-logarithmic distributions (dN/dD , not $dN/d\log dD$ as used in the manuscript). For further information see Section 8.1.3 and Equation 8.16 in Seinfeld and Pandis (2006) or other standard textbooks of aerosol and atmospheric science (e.g. Hinds, 1999; Baron and Willeke, 2001).

[RC 2.5] Minor Comments

[RC 2.5.a] 1. Page 17706: last sentence is incomplete.

[AR 2.5.a] This typographical error was corrected.

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[RC 2.5.b] 2. Figures 4, 5 and 8: It would be helpful to include the standard deviation of the hourly means plotted in the top panels, to help distinguish whether maxima are statistically significant.

[AR 2.5.b] Following up on this suggestion we will add bars (quartile areas) representing measurement variability in the revised version.

[Interactive comment on Atmos. Chem. Phys. Discuss., 9, 17705, 2009.](#)