

Interactive comment on “Fluorescent Bioaerosol Particle, Molecular Tracer, and Fungal Spore Concentrations during Dry and Rainy Periods in a Semi-Arid Forest” by Marie Ila Gosselin et al.

Anonymous Referee #3

Received and published: 5 October 2016

The manuscript is very well written and I believe of great relevance to the bioaerosol scientific community. The authors present very interesting and novel work comparing data from modern Light/Laser induced fluorescence (LIF) instruments with molecular tracers such as arabitol and mannitol. The paper also attempts to display the data in new ways scaling particle number to mass concentrations. The paper is very well cited and builds well on previous work. Thus I believe the paper should be published upon the correction of some minor technical/specific issues discussed below.

Specific/technical comments:

Comment 1: L62-63 “For example, asthma and allergies have shown notable increases during thunderstorms due to elevated bioaerosol concentrations” This is indeed true

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however allergic rates have been climbing in recent years and I feel this should be incorporated. I suggest using the reference.

Linneberg, A., 2011. The increase in allergy and extended challenges. *Allergy*, 66(s95), pp.1-3.

Comment 2: L139 should H₂O have a sub-scripted 2

Comment 3: Were the differences in sampling lines of the WBS and UV-APS calculated? Reynolds number for instance?

Comment 4: Were all particles assumed to be spherical for the density calculations or was the WBS ability to determine shape utilized?

Comment 5: Do you believe that cluster 1 is solely a fungal spore cluster, given its size range overlaps with that of some bacteria?

Comment 6: Why was a rainfall accumulation threshold of greater than 0.201 chosen?

Comment 7: What did the correlations look like before the manual reclassification of some of the rain/dry periods? How much did this effect it?

Comment 8: L 430-431. The Hill 2009 reference does talk about increased wetness effecting the fluorescent properties in comparison to dry samples however in this study wet samples were particles suspended in solution rather than particles at higher relative humidity's. I believe that this line should be rewritten. Do you believe the particles sampled during wet periods to be in droplets or to have increased moisture content? Could a moistened PBAP have increased fluorescence due to fluorescent compounds being extracted/leached to its surface?

Comment 9: Was there much difference in fluorescent intensity for FAP on Dry and Wet periods?

Comment 10:L555 Should "Figures 6 c-f" read "Figures 6 d-f"?

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L560 Should “Figure 6 c, d” read “Figure 6 d, e”?

L567 Should “Figure 6 e, f” read “Figure 6 g, h”?

Comment 11: For the total particulate matter mass concentrations why did you not use the high volume sampler samples to determine the total mass? Instead of the UV-APS measurements.

Comment 12: You mention Cladosporium are generally present/released at dry periods was there any evidence that this occurred during this campaign?

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-743, 2016.

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