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Interactive comment on "Characterisation of bioaerosol emissions from a Colorado pine forest: results from the BEACHON-RoMBAS experiment" *by* I. Crawford et al.

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The paper uses Hierarchical Agglomerative Cluster analysis to classify the emissions of the bioaerosols. The article is well written and my recommendation is that it should be published after the questions below are answered.

General comments:

In the Introduction authors state that the temperature would also be a significant factor affecting to the concentration of biological aerosols. Did the authors test the effect of temperature or other meteorological factors in their data? Or did the classification of

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the data into "dry" and "wet" act as indicator for all meteorology?

I would also like to see more proofs that the results from the two measurement points are really comparable. Even local meteorology may cause differences to the measurements. Wind conditions combined to some local source might be this kind of effect.

Specific remarks:

Page 2513: The authors discuss about the cluster solutions. The clusters should be introduced also in here, not just refer to Robinson et al. The results are hard to follow if the definitions of the clusters are not easily accessible. However, cluster analysis is a legitimate method for this kind of study.

Section 6.1: The polynomial fits

Reviewer 1 already asked for the physical justification of the polynomial fit but I would also like to know the goodness of fit of the function. In addition, I would like to hear the authors comment on the generalizability of the polynomials. Especially with small number of observations three or five order polynomials may fit perfectly to the measurements but will not fit any other similar data. Instead of building an overfitting polynomial could it be possible to construct a multivariate nonlinear function with other meteorological parameters?

Page 2516, lines11-18: In fig 5 the scaling of the two plots somewhat misled me first. There seems to be decreasing trend in the concentration starting around the time of sunrise and ending few hour after noon. This clearly related to air temperature or solar radiation. This also relates my comment above: the effects of local meteorology should be discussed more

Page 2516, lines 19-23: What causes this diurnal variation? Is it a function of solar radiation?

page 2520, lines 8-11: is RH a cause or indicator for this?

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Page 2521, Eq 5: I would like to see some goodness-of-fit estimate for this.

Page 2522, lines 5-6: Is the correlation calculated or "visually observed"?

Page 2526, line 25 onward: Does precipitation induce production or reduce sinks?

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