**Atmospheric
Chemistry
and Physics
Discussions**

Interactive
Comment

Interactive comment on "Source attribution of Bornean air masses by back trajectory analysis during the OP3 project" *by* N. H. Robinson et al.

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We thank the reviewer for reading our manuscript and have detailed our responses to their specific questions below.

1: p 15165 line 24. Do the authors mean the 'last' 36 h, i.e. those closest to the measurement site? Reword to avoid ambiguity.

- This interpretation is correct and we will reword this line accordingly, replacing "last 36h" with "36h closest to the measurement site"

2: p 15167 line 10. Is this the percentage of all trajectories calculated? line 13: is this an appropriate statistic for data which are (probably) not normally distributed? would it be more robust to use a non-parametric measure?

- This is the percentage of all trajectories calculated. "the percentage of back trajectories used" will be changed to "percentage of the entire set of calculated back trajectories used" on the line indicated.

- With regard to the appropriateness of the use of Pearson's r as a statistic for comparing mean value maps, we believe it is a valid and transparent statistic to quantify the similarity of mean value maps. Pearson's r is recognised as being applicable to non-normally distributed data. It is true that more weight is applied to outlying points, however we do not consider this a problem, as map regions of similarly great values would be expected to indicate similar sources. Pearson's r is only used here to provide some degree of comparison between mean value maps and no derived statistics are presented, and to this extent, we believe it is suitable.

3: p 15171 line 29. Check spelling 'Sumatera'

- As far as we can tell, Sumatra is the accepted English spelling, and Sumartera is alternative spelling used in Indonesia. As such we will leave the spelling as it is in the original manuscript.

4: p 15173 line 10. ...algae which have been shown...

- We will change the indicated line accordingly.

5: line 16. Not clear - less separation between terrestrial and marine trajectories presumbaly implies potential sources from both terrestrial and marine, rather than 'relatively weak on-island sources'.

- This sentence is unclear and will be changed. The term "relatively" referred back to the previous discussion of the polybrominated compounds. "which may be due to relatively weak on-island sources" will be removed as this is expanded upon in the next sentence.

line 26. ...known to comprise oil palm....

- We thank the reviewer for bringing this to our attention and will change the indicated line.

6: p 15185 line 12. not clear - presumably the HCl displaced from sea salt is measured by AMS as ammonium chloride, rather than the aqueous sodium nitrate being more easily detected (than what?)

- We will change "to give aqueous sodium nitrate that would be more easily detected by the AMS" to "to give aqueous sodium nitrate that can react to form aerosol that is more efficiently vapourised by the AMS than sodium chloride."

7: to address issues of uncertainties, which are not sufficiently covered in text, I suggest showing statistically significant differences between Marine and Terrestrial data in Table 4, using ANOVA or similar approaches. A non-parametric approach may be appropriate. Statistically significant differences could be designated by an asterisk for 5% probability level, for example.

- We recognise that this would be a valuable addition to the manuscript and have performed a non-parametric test of statistical significance (specifically the two tailed Mann-Whitney U test). This shows that all quantities apart from total organics and methyl bromide are significantly different at the 95% confidence level. We will add asterisks as suggested and the following text to the caption of Table 4:

"Marine and terrestrial data sets that are significantly different with a 95% confidence level (using the two tailed Mann-Whitney U test (Cheung et al. 1997), which is non-parametric) are marked with an asterisk."

Cheung, Ying Kuen, and Jerome H. Klot. 1997. "The Mann Whitney Wilcoxon Distribution Using Linked Lists." Statistica Sinica 7: 805-813. http://www3.stat.sinica.edu.tw/statistica/oldpdf/A7n316.pdf.

Table 4: CO data are reported to too many significant figures - 3 are sufficient

- These values will be changed accordingly.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 15157, 2011.

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