

## ***Interactive comment on “Effects of aging on organic aerosol from open biomass burning smoke in aircraft and lab studies” by M. J. Cubison et al.***

**Anonymous Referee #2**

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This work is an attempt to analyze some recent and very interesting field and lab measurements, some of which are already published, and which likely constitute a major result from a major campaign. For this reason, I hope that they eventually are properly documented, with the citations that should be added as noted by other Comments posted in the ACPD discussion, and of course with appropriate material on “aging” once Hecobian et al. 2011 is peer-reviewed and publicly available. The global estimate presented is too briefly presented to evaluate, and is at best (as noted) “a first estimate” based on very limited data – but nonetheless useful if documented. If these things are done, I think this will make an important contribution to the literature on this topic. As it is, the existing focus of the paper on what 44 and 60 may or may not rep-

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resent chemically, and how they co-vary, seems directed at the AMS community rather than the broader ACP audience, and really might fit better in AMT. In sum, as noted below, I cannot support publication of this aging-focused paper without access to the aging calculations in “Hecobian et al. 2011”, but I may be willing to review it again once that work, and the other required revisions, are provided.

Comments: p.12107 Zhang et al. (2010) report poor correlation between K and fire counts in the Southeast US, which they attribute to the influence of other K sources such as soil dust, sea salt, vegetation and meat cooking” –while this is true (and discussed in more detail in a broad range of prior publications to the one noted here), isn’t it possible to correct for or remove these influences in many cases?

p.12108 while this discussion attempts to “prove” that m/z60 is from BB sugars and m/z44 is from acids, they do a very limited job of citing the uncertainty associated with such proof, such as the lack of quantitative relationships and the lack of ambient support for these two tenets. A more balanced discussion would note both of these facts.

p.12111 data are shown from CalNex, and the only reference describing the project is an AGU talk (Hayes et al. 2010) for which there is no peer-reviewed publication describing the location or measurement details. Provide the details in this work, or wait til that work is published, or omit CalNex data from this publication.

p.12116 given the central and repeated role of age in the analysis and conclusions of this paper (the words age and aging are used 85 times in the document), the method used to estimate that age, and the required assumptions, should at least be discussed here rather than simply referencing the Hecobian work, which I had initially presumed was published and/or publicly available. However, it turns out that this work is either omitted entirely from the reference list as there is no “Hecobian et al., 2011” or it is the incomplete and un-peer-reviewed (“Hecobian and Weber. . .in preparation”). Further, given that “age” is not a simple or measurable parameter and its calculation likely relies

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on questionable assumptions, I see no way to approve publication of this work without access to even a draft copy of that work.

p.12117 “the two parameters are effectively independent” – what does this mean? Linearly independent, if so based on what metric?

p.12119 “cumulative probability distributions (CDFs)” why not cpds? Or include “functions”?

p.12121 this calculation is not clear. Please define terms and explicitly state how to get 8 Tg/yr and 5%. Define “netOA”, “delta OA”, “POA”, delta CO, etc.

Fig. 4 The “inset” isn’t an Inset. Try labeling panels as is appropriate for an archival publication.

Fig. 7 It would help to give the years of the cited publications, let the authors get a reputation for being sloppy in their citations; for example, the plot says “DeCarlo et al.” but there are no less than three of these in the reference list.

Supp info – Five figures are provided with no text. Please discuss here, and cite in MS, or omit.

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 12103, 2011.