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Atmospheric Chemistry and Physics Discussions

Interactive comment on "In situ vertical profiles of aerosol extinction, mass, and composition over the southeast United States during SENEX and SEAC^{4}RS: observations of a modest aerosol enhancement aloft" *by* N. L. Wagner et al.

Anonymous Referee #2

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This manuscript uses aircraft in-situ data from two different campaigns (SEAC4RS and SENEX) during the summer and early fall of 2013. The aircraft platform has advantages to other platforms (space and ground) in that vertical layers can be probed directly. The analyses presented though representative of a small time period, are methodical and logical. However, these results seem to be disconnected to other research in this area. This reviewer kept waiting to read about how these results tie in (or do not tie in) with other contextual works. The conclusion could potentially be quite insightful, if given the proper context in which to state it. Overall, the work is sound and could be

improved by minor changes.

Specific points:

1 - Section 3.1: Were there any other measurements that could be related to ground-based measurements similar to Fig. 4 in Section 3.1. This could open up an avenue of comparison with older field intensive studies in the same region, e.g., Atlanta Supersite Experiment in 1999.

2 - Typo: Line 9 3143 change expecting to expected

3 - Section 4.3: It would have been more conceptually thorough if the authors had brought in some satellite (CALIPSO for vertical profile comparison, OMI as another indicator of the lack of biomass burning aerosols) observation comparisons in Section 4.3. Even if that work is being done by another author, a reference to those results would have been helpful to understand what dynamics the entire region was undergoing at the time of these flights. Or the authors could have compared their results with time averaged satellite information, which could open up the avenue for discussing how similar or dissimilar summer 2013 was from other summers.

4 - Section 4.3: There did not appear to be much summarization at the end of each respective section. Is that on purpose? The only section that does an adequate job in relating that section's work to the field at large is Section 4.3.

5 - Conclusions: Most of this section speaks to the the hypothesis of an elevated layer of aerosols which account for changes in AOD and the author's perspective on that. What about the other results? How do these other results shown in Figs 1-12 support the author's thesis statement? There was a lot of work done to create these different analyses, yet at the end there's scant mention of them.

6 - Figures: Fig 13 is somewhat confusing. What does the blue portion of the figure represent? A couple of sentences added to the caption would help orient the reader.