

Interactive comment on “Impact of biomass burning on pollutants surface concentrations in megacities of the Gulf of Guinea” by Laurent Menut et al.

Anonymous Referee #1

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Summary: This paper presents modeling results from the DACCIA project. Model results are performed for the period May – July 2014, with and without biomass burning emissions. The model results have been compared to a variety of observations. The model simulations appear to be of high quality, and the authors do compare the model to observations and not the weaknesses/strengths of the simulation. However, the paper is tediously long and very un-focused. There are 15 Figures, many of which could be moved to SI. There are also randomly short sections (e.g. Section 7.1 and 7.2 which contain only a few sentences each). Many of the Figures are model output

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for specific days, but the logic behind the choice of day is hard to follow. Thus I can't recommend that this paper be accepted for publication in ACP as it currently is formatted. I see that there has been a class exercise devoted to reviewing this article, and they note several grammar issues. I also see quite a few grammar issues, but I have not pointed them out specifically because I think re-structuring is necessary. Here is my recommendation for re-structuring.

- 1) Begin with a single large map (similar to Figure 1) that shows the locations of the urban areas of interest, and biomass burning emissions during this period of time. Remove unnecessary figure clutter, and label the legend. This is currently not done in Figures 2 and 3. The current versions of Figure 2 and 3 can be omitted or moved to supplemental.
- 2) Separate the observations from the modeling. It does not makes sense to have sites with no measurements listed in Table 1.
- 3) Describe the essential components of the modeling in the methods, and move some of this information to SI. This section is currently 5 pages. The documentation is good for reproducibility, but can be moved to SI.
- 4) Begin the paper by showing the observations, rather than the model results. Figure 9 would be a good place to start. This Figure shows large areas of high AOD corresponding to fire and dust emissions. The legend should be labeled (not with a green highlighted text, but rather next to the legend in plain English). Then I would move to describe Figure 10. It would be good to focus on specific events that are simulated well and those that are not simulated well. Highlight those events with colors. From here, the authors could present Figure 8, which shows the maps of surface tracer concentrations for a specific day (27 July). This Figure should be clearly linked to Figure 10 and potentially to Figure 11 and 12. Without this link, the choice of model output seems very random.
- 5) Push most of the model validation to the SI.

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6) End the discussion by noting the key points of Figure 14 and Figure 15. Please put the gas phase species in ppbv rather than ug/m3. It is unclear if Figure 15 is the amount of PM10 attributed to fires. The caption is confusing.

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