

Interactive comment on “Aerosols from anthropogenic and biogenic sources and their interactions: modeling aerosol formation, optical properties and impacts over the central Amazon Basin” by Janaína P. Nascimento et al.

Anonymous Referee #2

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The paper presents a case study of observational and modeled data of the impact of the urban plume of the city of Manaus in the Amazon in Brazil on the pristine regions downwind of the city within the rainforest. The WRF-CHEM model simulates atmospheric natural and anthropogenic aerosols and trace gases and investigate the formation of Secondary Organic Aerosols as well as ozone. In general, the manuscript is very well written, is based on the relevant literature and presents interesting new results and fits within the scope of ACP.

In some parts the discussion lacks a bit of clarity and I suggest that the findings be

C1

communicated in a clearer way, prior to publication.

In the following I list general comments that should be addressed. The specific comments can be found in the attached commented pdf-file.

- 1.) In the meteorology section, the general meteorological patterns of the region could be described in a bit more detail, for readers who are not familiar with the region.
- 2.) During the text you vary between present and past tense, revise for consistency.
- 3.) As you solely analyze one episode, how representative is it in general for the region? Is the plume of Manaus always heading in this direction?
- 4.) It is not explained why you needed to use the HYSPLIT model, when you have a powerful 3D atmospheric-chemistry model at hand, this should be better explained.
- 5.) You report an offset of three hours between peaks of your modeled data versus observed data for the meteorological parameters, which is not so small. If this has not yet been done check in detail if both data sets are either in UTC or LT. The statistics in numbers looks good, but the high Pearson coefficient with this offset seems unlikely, please confer.
- 6.) Why are there so significant differences between the BC of the global ECMWF model and your WRF runs, if the regional WRF model uses the global model data as initial and boundary conditions (Figure 2)? The global model should provide the adequate level of BC concentrations from the trans-atlantic transport into the domain of the regional model via its north/eastern domain border.

Please also note the supplement to this comment:

<https://acp.copernicus.org/preprints/acp-2020-1002/acp-2020-1002-RC2-supplement.pdf>

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C3