

Interactive comment on “Aerosol and precipitation chemistry in a remote site in Central Amazonia: the role of biogenic contribution” by T. Pauliquevis et al.

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We thank the reviewer #2 for a quite comprehensive review. Your work has improved the manuscript considerably.

Topic general comments: Here the reviewer main observation is that we could strength the discussion of aerosol contribution to rain chemistry. This was done in the final discussion of the revised version.

Answers to the General Comments

1- In the revised version the statistical analysis is done on a monthly basis instead of

C10151

only seasonal. This has allowed seeing the transition seasons as well as dry and wet periods.

2- As mentioned in issue 1, now the analysis is done on a monthly basis. An enhanced discussion between species and sources is done at the beginning of results section.

3- A discussion of rainwater chemistry is enhanced in the revised version of the manuscript. A new discussion of acidity of rain and how it can be explained in terms of mineral acidity versus weak organic acids is now included. Also a discussion between the analysis of rainwater in terms of concentrations versus depositions is done in the revised version.

4-As mentioned before, a more complete discussion between rain chemistry and aerosols is done.

Questions and Minor comments:

1-As correctly suggested, we changed the expression “long term measurements” to “In this paper we discuss a 3.5 years data set of aerosol and precipitation chemistry. . .” Another point raised in this comment was about BC analysis. The revised version of the manuscript now includes a detailed description of BC analysis. The method is described in details in Martins et al., GRL 2009. The technique exactly as was used in this manuscript was compared with other BC measurements (TOA, Sunset OC analyzer) in the paper from Soto-García in ACP 2011.

Regarding the issue of figures 2 and 3, we redesigned the figures to make more clear the different timing of each filter collection. This allowed to see data gaps and compare adequately the different plots.

Regarding the requested calculations of enrichment factors, such calculation was done in the revised version. We used several Earth Crust composition (Mason, McDonough, etc), and the basic conclusion is that in aerosol calcium is predominantly from crustal source. In the rainwater more than 90% of calcium is non-sea-salt (table 5), and cal-

C10152

cium is associated with both soil dust and biogenic aerosols.

We agree to reformulate the section numbering, and Section 4.1.1 was removed.

The table 3 labels and scale were fixed, as suggested.

The revised version of the manuscript includes a new and more detailed analysis based on monthly means. In particular this more detailed analysis was important for the partitioning of BC. One important issue is the recent results from several references (discussed and included in the text) that show the absorption properties of natural biogenic aerosol, in addition to the biomass burning component. An enhanced discussion of EBC in the coarse mode is now included. We decided to change the overall nomenclature from BC to EBC (Equivalent black carbon) to follow the new literature.

We shortened the discussion on sea-salt impacts as recommended.

We added a discussion of absorbing properties of soil dust particles, mentioning that in our case, due to the low soil dust load in the atmosphere, this component is really small.

The referee is correct pointing the discrepancy in the soil dust apportionment. We made clear the two different dust component: The long range transported Saharan dust, and the local and regional soil dust.

Corrected: Figure 8 Y axis of the figure is FINE (not FFINE)

Section 4.2.2: We enhanced the discussion of deposition fluxes including a discussion on seasonality of precipitation.

Regarding the attribution of biomass burning in aerosols and rainwater, the reformulated monthly means analysis of elemental and ionic composition allowed us to construct better linkages between aerosol and rainwater chemistry:

We enhanced the discussion between deposition fluxes and VWM .

C10153

Regarding the Reviewer 2 last points, we performed several new statistical analyses of the data base, as explained above in the text. In the new conclusion session we pointed several new arguments that were obtained through this approach with respect to seasonality, annual cycles and sources. We think this made the final section of the manuscript much more clear.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 11465, 2007.

C10154