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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Chemical properties of rain events during the AMMA campaign: an evidence of dust and biogenic influence in the convective systems" *by* K. Desboeufs et al.

Anonymous Referee #2

Received and published: 27 July 2010

Review to "Chemical composition of rain during the AMMA campaign" by Desboefs et al., ACPD, 2010

This paper reports on measurements of the chemical composition of rain water sampled before and after the monsoon onset during the AMMA project. The authors show that the composition of the rainwater is dominated by uplifted dust. The composition changes between pre-monsoon and monsoon conditions, leading to a higher organic content of the rain water during the monsoon season. This shows the biogenic influence on the rain composition and also the possibility of deposition of organic material along with nutrients like iron to the Atlantic Ocean. The paper is well written (the use

of English language has significantly improved compared to the first submitted version) and provides valuable data. I recommend publication in ACP after the following questions and technical correction have been addressed:

Specific comments:

Abstract & later: The Harmattan layer and the Harmattan winds are mentioned, but not explained. It has to be briefly mentioned in the introduction what the Harmattan layer is.

Abstract & later: What are "diatoms"? It is never explained

Page 15267, line 27: give model number of the Grimm OPC

Page 15268, equation 1: I don't think it's necessary to write this equation down.

Table 1: "particulate charge" is not the best expression. I'd prefer "particulate mass concentration".

Page 15270, 1st paragraph: "The analysis of the convective activity in Africa during AMMA campaign (Janicot et al., 2008) shows that the typical transition phase corresponding to the monsoon onset in 2006 is centred on 3 July, ten days after the mean onset date (1968–2005)." It took me a while to understand the meaning of this sentence. I suggest to reformulate: "The analysis of the convective activity in Africa during AMMA campaign (Janicot et al., 2008) has shown that the transition phase that corresponds to the monsoon onset was centered on 3 July in 2006, which is ten days later than the mean onset date (1968–2005)."

Page 15272, line 6-8: "However, the comparison of our results on the estimated mass percentage with others works based on other methods of mass calculation could be biased." What reasons do you have that lead to this assumption?

Page 15276, line 3-4: "A potential contamination of the dissolved phase by fine dust particles could explain this disequilibrium". I don't understand this argument. Also the

fine dust ions should be neutral. You can argue that in this case NH4 should be more important than Mg and Ca, but since you measured NH4, the ion balance should be neutral.

Page 15276, line 6-8: I don't understand the meaning of this statement on the rain pH. How can the rain be "usually alkaline" while it is neutralized by CaCO3? Do you mean "Precipitation pH in Banizoumbou is usually alkaline (median pH around 6) but is partly neutralized by carbonates (CaCO3) from mineral dust. . ." ?

Technical notes:

Page 15267, line 9: "0.5 dm2" –> replace by 50 cm2

Page 15267, line 10: replace "experimenter" by "operator"

Page 15268 line 6: "..in THE non-filtered fraction of THE rainwater. . ."

Page 15270 line 17: replace "on Fig. 2" by "in Fig. 2"

Page 15271, line 3: remove comma between "a" and "slow"

Page 15271, line 11/12: either ". . .the aerosol loading . . . is very high. . ." or ". . .the aerosol loadings . . . are very high. . ."

Page 15271, line 21 remove full stop after sea salt

Page 15271, line 22: ". . .whereas its Na and Ca contents. . ."

Page 15271, line 27: The sentence would make more sense to my if it reads: ". . .of the precipitation, but the effect. . ."

Page 15272, line 14: I suggest "in the rain samples,. . ."

Page 15272, line 15: "than the previous value previously reported", better: ". . .than the previously reported value of ca. 0.2 . . .."

Page 15273, line 2: delete the "as" between "negligible" and "compared"

Page 15273, line 11: replace "kms" by "km"

Page 15273, line 25 & 26: ". . .south of THE Sahara. . ." and ". . .from THE North-Western Sahara. . .", same on page 15274, line 4

Page 15274, line 20: ". . .not significantly different. . ."

Page 15275, line 5: ". . .contents are observed. . ."

Page 15278, line 27: Crumeyrolle

Figure 6 caption: replace "blues" by "blue"

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 15263, 2010.