

***Interactive comment on* “Emission and deposition of accumulation and coarse mode particles in the Amazon basin” by L. Ahlm et al.**

Anonymous Referee #2

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Ahlm et al. present size resolved aerosol number fluxes measured using the eddy covariance method over the Amazon rain forest in Brazil. They observe net deposition of smaller particles and net emission (in clean wind sectors) of coarse mode particles. These findings are interesting, which, along with the lack of similar work in the literature, would make this a suitable paper for publication. I have a number of minor comments. The language in particular needs some work but the changes I suggest below should suffice for publication.

Page 14017 line 20: include u^* in brackets after “friction velocity”

Page 14018 line 10: “The Grimm 1.109 has a response time of 1 s” You said this earlier. I don’t think there is any need for repetition.

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Page 14020 line 1: Change “to avoid rainwater to enter the sampling line” to “to prevent rainwater entering the sampling line”

Page 14020 line 2: Change “was slightly bended also in two other points” to “was also slightly bent at two other points”

Page 14020 line 8: Change “loss” to “losses”

Page 14020 line 11: Change “Losses due to diffusion were estimated by relations for diffusion in laminar flow in Hinds et al. (1999).” to “Losses due to diffusion were estimated using the relations for diffusion in laminar flow given by Hinds et al. (1999).”

Page 14020: “No Webb correction has been applied to the fluxes.” Nevertheless, a reference to Webb et al would be appropriate here.

Page 14020: How do the inertial and diffusional losses vary for the rest of the size channels?

Page 14022: “...likely transported from the Sahara”. On what do you base this? Do you have back trajectories? Also include a reference to where this has been observed previously.

Page 14022: “Earlier studies of the aerosol number size distribution over the Amazon rain forest have shown that the two dominating aerosol number modes are located at diameters of 60–90nm and 130–190 nm, respectively”. I find this sentence a little clumsy. Firstly, change “Earlier” to “Earlier”. These modes are “respectively” to what? If you are referring to the references in the brackets, then put the “respectively” in the brackets with them. I think the sentence would read better as: “Earlier studies of the aerosol number size distribution over the Amazon rain forest have shown that the two dominating modes occur at diameters 60–90 nm and 130–190 nm”.

Page 14023 line 1: Is it a statistically significantly larger fraction? If so replace “some-what” with “significantly”. If not, say so.

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Page 14023 line 2: Change “of Rissler et al.” to “by Rissler et al.”

figure 3: Why do you show $dN/d\log D_p$ on both a natural and logarithmic axis? I would just show one or the other - preferably the logarithmic axis. In the caption, change “...when data collected when the friction velocity is below 0.1 m s^{-1} ” to “...from data collected when u^* is above 0.1 m s^{-1} ” since you reject data when u^* is below 0.1 m s^{-1} , correct?

Page 14023 line 11: Change “This is consistent with that biomass burning is known to be a large source of primarily accumulation mode particles (Reid et al., 2005)” to “This is consistent with the observation by Reid et al. (2005) that biomass burning is a large source of primarily accumulation mode particles.”

Page 14023: Change “at minimum in daytime” to “at a minimum during the day”

Page 14023 line 26 to page 14024 line 2: But are these observations statistically significant given the variability shown in figure 4a, and therefore can you really make the conclusion in the following sentence? I am not fully convinced by this argument.

Page 14024: “The nocturnal transfer velocities are slightly higher in the wet season than in the dry season”. Is this statistically significant?

Page 14024 line 26 to page 14025 line 7: I would say this information is more appropriate for the figure caption rather than the main text. Please shorten this paragraph to a very brief summary at most and leave the full description for the figure caption.

Page 14026 lines 19-21: Again, this information is better placed in the figure caption. Indeed it already is in the caption - does it really need to be repeated in the main text? Similarly for Page 14027 lines 21-25.

Page 14028 lines 27-28: Remove “numbers of”

Page 14030 lines 27-28: “To exclude the anthropogenic sector does obviously not change the sign of the flux of $0.25\text{--}0.45 \mu\text{m}$ particles”. What do you mean by the

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word “obviously”? It doesn’t seem to be in the correct position in the sentence. If you mean it doesn’t change the sign “noticeably”, then use this word instead: “. . .does not noticeably change the sign. . .”

Page 14031 line 5: Change “instead will” to “will instead”

Page 14032 lines 2-3: Change “One argument for that rainfall may be important for the...” to “One argument for rainfall being important to the...”

Page 14032 lines 19-22: Change this sentence to “Neither does solar radiation seem to generate the emission directly, since the photosynthetic radiation is at maximum at noon, or even an hour before, as a result of increasing cloudiness in the afternoon.” I think it would be useful to show this graphically as well.

Page 14033 lines 1-2: Change “The relative humidity was during the wet season observed...” to “The relative humidity during the wet season was observed...”

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 14013, 2010.

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