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Interactive comment on “Seasonal variation of ozone deposition to a tropical rain forest in southwest Amazonia” by U. Rummel et al.

U. Rummel et al.

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We like to thank T. Karl for his interest and comments.

IC T. Karl: "... Based on the aerodynamic limit (R_a+R_b) the current paper (Figure 9) suggests maximum deposition velocities on the order of 2 to 6 cm/s at a similar site (Jaru) during daytime. This would imply that aerodynamic limits of deposition fluxes (as obtained from Figure 9) are smaller than deposition fluxes of acetone and various other VOCs that the authors have reported previously for the LBA-EUSTACH experiment (Table 4; Andreae et al., 2002). It would be helpful and of interest to the reader if the authors provided an explanation for this discrepancy or a comment on ozone (and/or R_a+R_b) measurements for the site in Manaus if available."

AC: The aerodynamic resistances (R_a+R_b) determined for our site (Jaru) are in a range

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which can be expected above a rough forest canopy. For the Manaus forest site the underlying quantities namely friction velocity and heat fluxes measured by Araújo et al. (2002), were of similar magnitude as for Jaru. This seems to support the objection of T. Karl. However, we think it is not in our competence to give a final answer to this problem here. The publication of Andreae et al. (2002) is a synthesis paper containing contributions of more than 20 authors. The data in question had been measured and provided by the groups of University of Tuscia and CNR Rome, and we can not answer here on their behalf. Besides, it should be considered, that the deposition velocity does not linearly depend on the corresponding flux and concentration (being the ratio of both) and thus the calculation of deposition velocities from averaged flux and concentration data (e.g. averaged over daytime and nighttime conditions or varying weather and burning conditions) is generally problematic. In addition, there is often a different data coverage in concentration and flux measurements (e.g. due to different requirements and quality selection) and thus Table 3 and 4 of Andreae et al. (2002) may not be based on exactly the same time periods.

Additional reference:

Araújo A.C. et al., Comparative measurements of carbon dioxide fluxes from two nearby towers in a central Amazonian rainforest : The Manaus LBA site, J. Geophys. Res., 107 (D20), 8090, doi:10.1029/2001JD000676, 2002.

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