

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

Anonymous Referee #2

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U. Rummel et al. “Seasonal variation of ozone deposition to a tropical rain forest in southwest Amazonia” describes seasonal and diel variations of tropical forest tower-based ozone deposition measurements taken in 1999 during the LBA-EUSTACH campaigns. Tower based measurements of ozone and ozone deposition in the tropical forest—and the impact of biomass burning on them—is a gap in the literature this paper works to fill. Most of the paper is devoted to disentangling the complexities of ozone deposition in a tropical forest across seasons and day vs. night. The methodologies are sound, with the usual appropriate micrometeorological corrections taken and fully described, and the results seem robust. The conclusions relating measured ozone deposition patterns with specific humidity deficit, stomate behavior, and night-time NO_x chemistry are all adequately reasoned. A secondary goal of the paper is

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comparison with similar measurements in a nearby pasture site to quantify the effect of deforestation in the southern Amazon on ozone deposition. The conclusion that ozone deposition to the pasture is reduced by 20-30% compared to the forest is plausible. This paper should be published in ACP with only minor changes.

Minor comments

1. Please address the interactive comment submitted by T. Karl. The author of that comment would seem to have more intimate familiarity with specific parts of the cited literature than this reviewer.
2. Figure 6 is somewhat superfluous. It is only briefly discussed and does not necessarily help the reader interpret either the results or the conclusion.
3. In the data rejection criteria (section 3.1, paragraph 2, page 7408 line 10), please provide a reference for the stated value of $u^*(\text{critical}) \approx 0.01 \text{ m/s}$. It is reasonable to assume that eddy covariance fluxes for a depositing species would be accurate in quite stable conditions. When momentum is not being transported down, neither are scalars, so 0.01 m/s would at first glance seem to be appropriate. However, the choice of $u^*(\text{critical})$ here appears somewhat arbitrary. A brief justification is needed if no reference is available. Also, how much data is rejected under this criterion?
4. Although interesting, the estimate of the regional forest-transformation effect on ozone deposition is very speculative (Section 5.4, paragraph 6, page 7428 line 2), especially given the careful qualifications attached to every other conclusion/calculation done in the paper. Some estimate of the uncertainty attached to these calculations is needed for this section to remain in the manuscript. The calculations are clearly of the “back-of-the-envelope” variety, so a similarly rough treatment of the uncertainty is required to justify if they have any relevance and/or are at all tied to reality. Please add this or eliminate the speculative calculation.

Technical comment

1. Section 4.2, paragraph 3 (page 7415, line 1) should read “During the wet season experiment, . . .”

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 7399, 2007.

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