

Interactive comment on “Measurement and modelling of the dynamics of NH₃ surface-atmosphere exchange over the Amazonian rainforest” by Robbie Ramsay et al.

Anonymous Referee #1

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General Comments The authors demonstrated the results of high-resolution measurements of NH₃ flux and wetness parameters in the Amazonian rainforest, where and then determined the NH₃ emission potential and the parameterization of the best performance. The manuscript is well organized and has interesting results rarely investigated at a tropical forest. I generally agree with the conclusions, but one concern about the new parameterization of leaf wetness parameter (LWP) popped up in my mind. When the authors "focus(ed) on the most suitable control metric for R_w" (L70), they found that the parameterization as Eq. (17) has the statistically better result than those using RH and VPD. Nevertheless, the final message is kind of negative as "However, such a parameter is ... RH based parameterizations" (L431-432) and "However,

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VPD may be the parameter of choice for chemistry transport models because it is more readily simulated." (L490-491). I can understand the meaning, but could you consider about much positive recommendation? For example, canopy wetness is actually often simulated by several land surface models coupled with meteorological model (e.g., Katata et al., 2010) and even in the chemical transport model (e.g., Cambell et al., 2019). In order to evaluate Eq. (17) for further model improvements, the comprehensive datasets of past and present (and future) LWP datasets in the world are helpful.

P.C. Campbell, J.O. Bash, and T.L. Spero (2019) Updates to the Noah Land Surface Model in WRF-CMAQ to Improve Simulated Meteorology, Air Quality, and Deposition. *J. Adv. Model Earth. Syst.*, 11, 231–256. G. Katata, H. Nagai, M. Kajino, H. Ueda, and Y. Hozumi (2010) Numerical study of fog deposition on vegetation for atmosphere-land interactions in semi-arid and arid regions. *Agr. Forest Meteorol.*, 150, 340-353.

Specific Comments L44, L138, L353, and references: no journal information of Ramsay et al. (2020) which includes the core data of this study. I believe that this must be peer-reviewed by appropriate scientific journal, but if it is not the case, please provide the detailed information about, e.g., the validity of the flux measurements of HNO₃ and HCl (L138) and the estimation method of reactive N dry deposition, 1.74 kgN/ha/yr (L353).

Technical Corrections L24-27: the evidence from recent literature is required Fig. 2 and 3: it is hard for readers to compare the flux (Fig. 3) with related parameters of RH, VPD, and LWP (Fig.2). Why not separate Fig. 2 into two periods as Fig. 3 and combined them with Fig. 3? Fig. 4: pls specify the period, and add "(LWP)" just after "leaf wetness parameter ." Also x-axis of the third panel may be revised as "LWP" L301: insert a space between "alpha" and "for a fully ..." L309: nighttime should be "1900-0600" to cover the entire period of one day? L364-365: revised as "... openings (Urban et al., 2017), while ..." L385-387: the positions of several parentheses are wrong. also "(1998)" is duplicated L456: should be "heavy precipitation periods"

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