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Supplement of

Biomass burning emission disturbances of isoprene oxidation in a tropical forest

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S1. Interpolation grid used in the Figures 3 and 5.

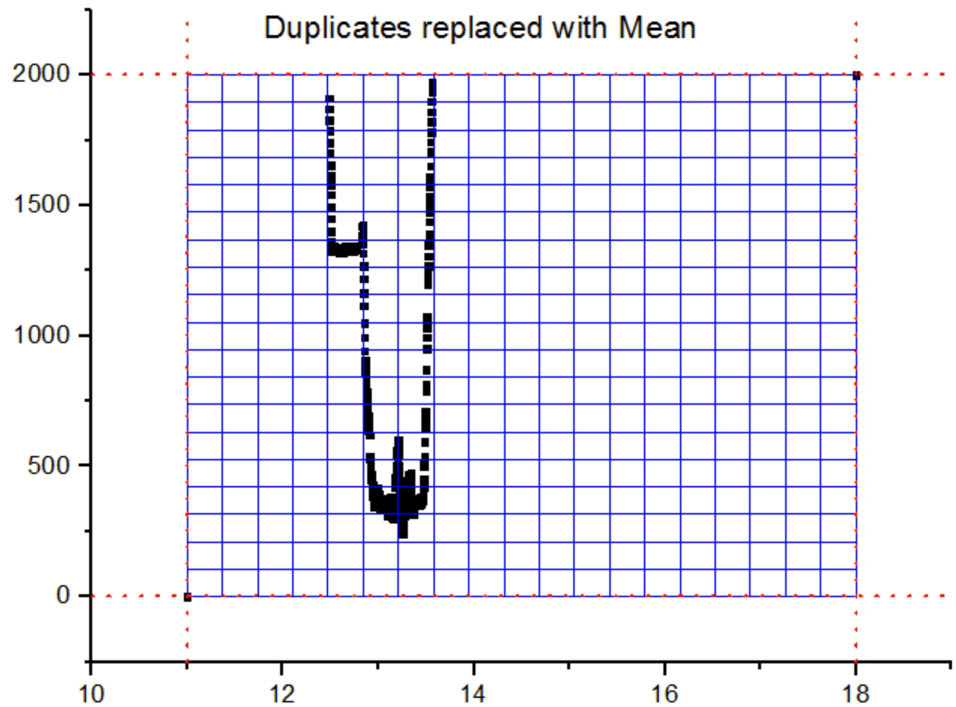

Figure 1. Interpolation grid (0 - 2000m and 11 - 18h)

S2. The kinetic rate constant measurements for OH + ISOPOOH (1,2- and 4,3- ISOPOOH), at 297 K, is 7.5 x 10^{-11} cm^3 $molecule^{-1}$ s^{-1} for (1,2)-ISOPOOH and 1.18 x 10^{-10} cm^3 $molecule^{-1}$ s^{-1} for (4,3)-ISOPOOH (St Clair et al., 2015). The kinetic rate constant of MVK + OH = 1.88 x 10^{-11} cm^3 $molecule^{-1}$ s^{-1} and MACR + OH = 3.35 x 10^{-11} cm^3 $molecule^{-1}$ s^{-1} (Apel, 2002).

K_{prod} Average kinetic rate constant = 6.1325 x 10^{-11}

$K_{iso} - K_{prod} = (1.1 \times 10^{-10}) - (6.1325 \times 10^{-11}) = 4.8675 \times 10^{-11}$

S3.

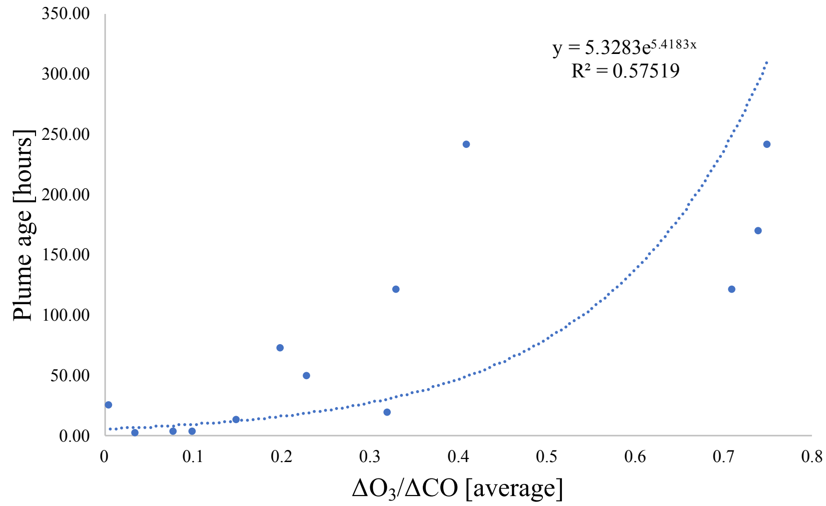

Figure 2. Observations of the ratio $\Delta O_3/\Delta CO$ as a function of plume age in tropical and subtropical sites.

S4.

Simulated convective velocity and planetary boundary layer from WRF-Chem in the Forest Management Station ZF-2 (02° 36’S and 60° 12’W), 60 km north of Manaus (Dasa Gu, personal communication, June 2015).

Table 1. Convective velocity and planetary boundary layer used to calculate OH density following Karl et al. (2007) approach.

Time interval (t) *h*	Convective velocity (W) *ms^{-1}*	PBL (Zi) *m*
11-12	0.58	267
12-13	1.01	462
13-14	1.32	777
14-15	1.40	1075
15-16	1.40	1237
16-17	1.43	1209
17-18	1.31	1124

S5.

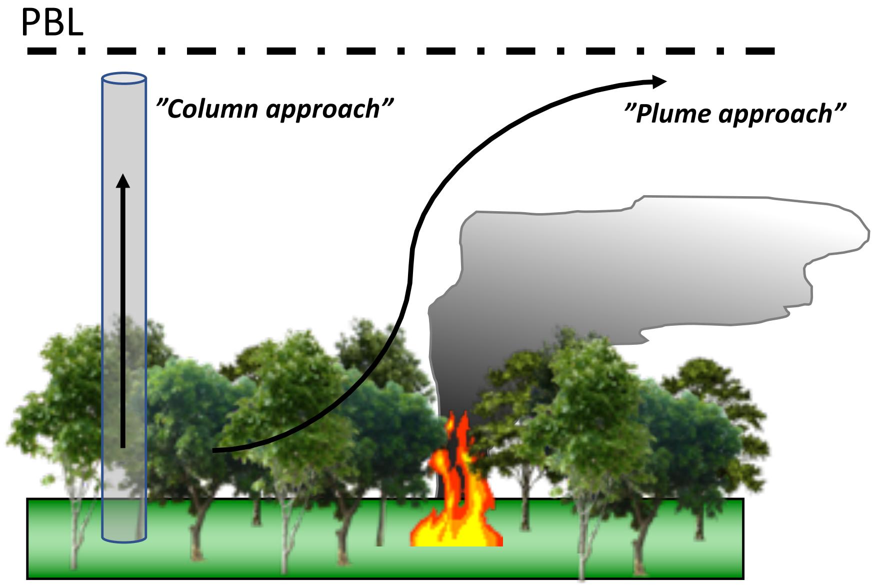

Figure 3. Schematic approaches used in OH calculation based on the sequential reaction model: (1) Column approach and (2) Plume approach, which considers vertical and horizontal transport for both biomass burning regimes and background environment.

S6.

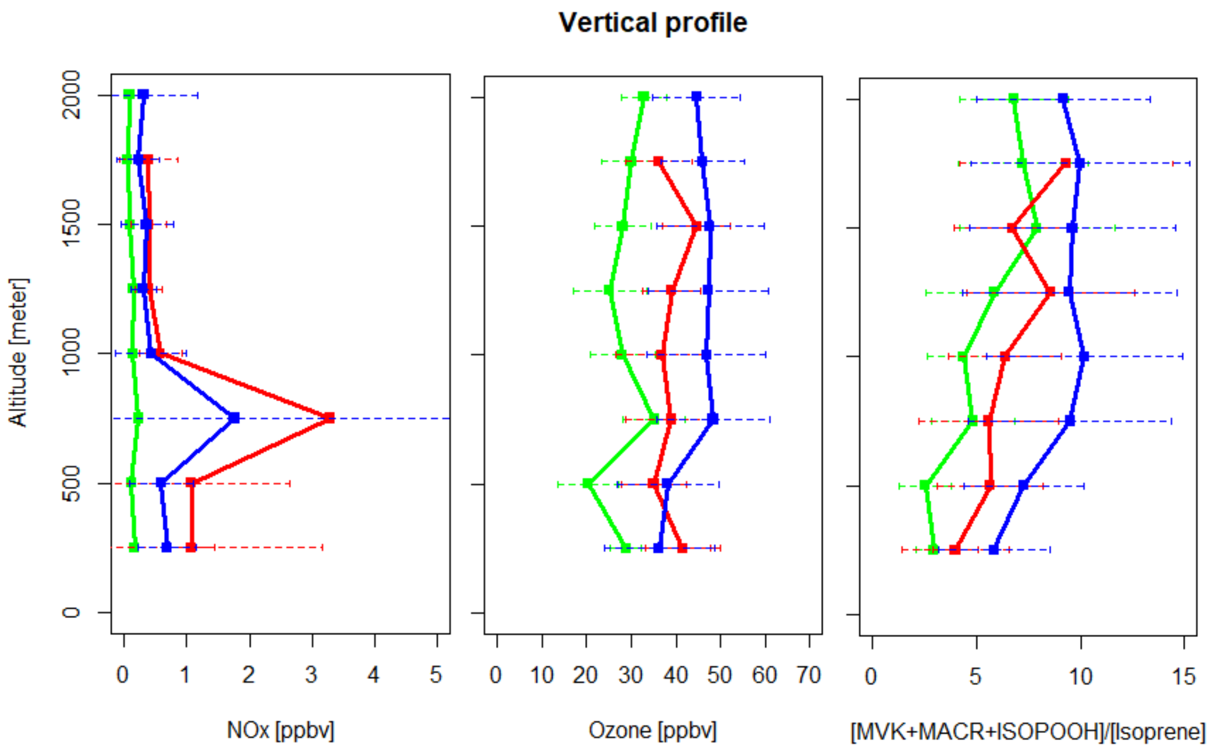

Figure 4. Vertical profile for the ratio [MVK+MACR+ISOPOOH]/[Isoprene], NOx and Ozone mixing ratios during SAMBBA campaign: background (green), fresh smoke plume (red) and aged smoke plume (blue).

S7.

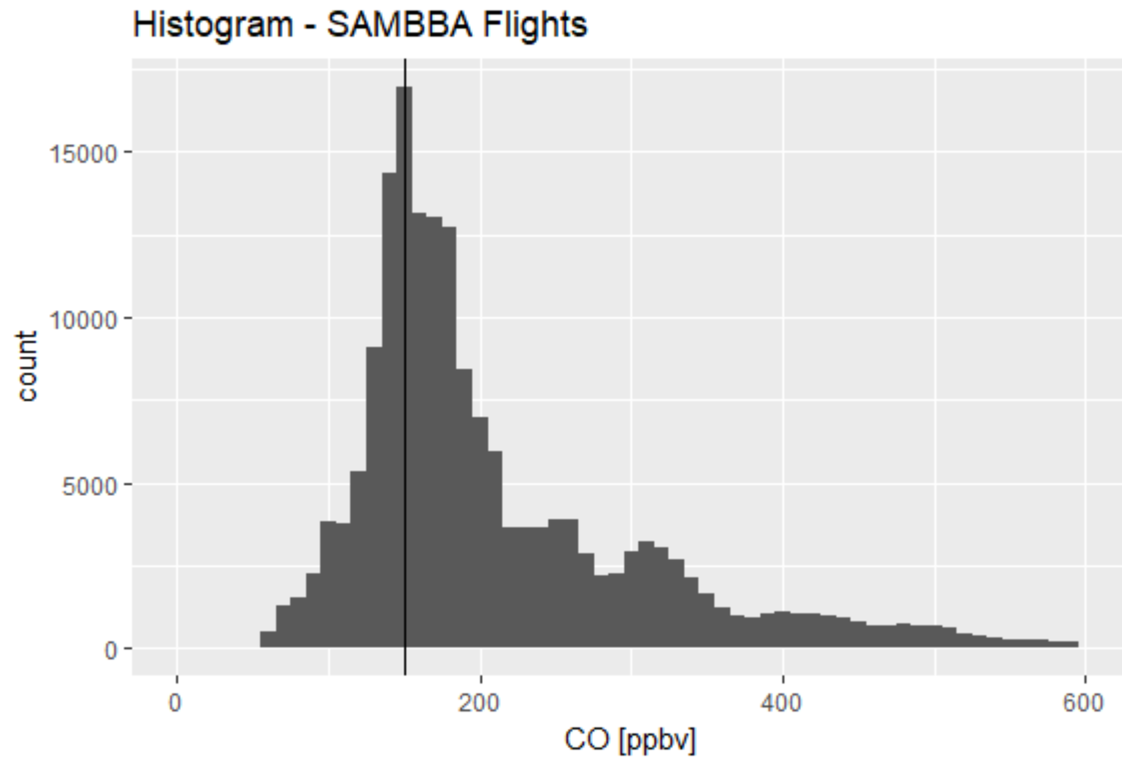

Figure 5. Histogram that present the frequency distribution of CO [ppbv] for all SAMBBA flights in Amazon rainforest.

References

Apel, E. C. (2002). Measurement and interpretation of isoprene fluxes and isoprene, methacrolein, and methyl vinyl ketone mixing ratios at the PROPHET site during the 1998 Intensive. *Journal of Geophysical Research*, *107*(D3), 1–15. https://doi.org/10.1029/2000JD000225

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