

Supplement to “CAM-chem: description and evaluation of interactive atmospheric chemistry in CESM”

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Abstract

In this supplement, we provide additional figures to discuss: 1) isoprene emissions, 2) regional aggregation of ozone sondes, 3) comparison with the aircraft observations climatology of Emmons et al. (2000), 4) comparison with the the Measurements of Pollution in The Troposphere (MOPITT v4, Deeter et al., 2010) data and 5) tropospheric OH distribution with the Spivakovsky climatology (Spivakovsky et al., 2000) using the Lawrence et al. (2001) diagnostic approach.

1 Introduction

2 Conclusions

References

- Deeter, M., Edwards, D. P., Gille, J. C., Emmons, L. K., Francis, G., Ho, S.-P., Mao, D., Masters, D., Worden, H., Yudin, V., and Drummond, J. R.: The MOPITT Version 4 CO product: Algorithm enhancements, selected results and bias drift, *J. Geophys. Res.*, 115, D07306, doi:10.1029/2009JD013005, 2010.
- Emmons, L. K., D. A. Hauglustaine, J.-F. Müller, M. A. Carroll, G. P. Brasseur, D. Brunner, J. Staehelin, V. Thouret, and A. Marengo: Data composites of airborne observations of tropospheric ozone and its precursors, *J. Geophys. Res.*, 105, 20,497–20,538, 2000.
- Lawrence, M., Jöckel, P., and von Kuhlmann, R.: What does the global mean OH concentration tell us?, *Atmos. Chem. Phys.*, 1, 3749, 2001.
- Spivakovsky, C. M., et al.: Three-dimensional climatological distribution of tropospheric OH: Update and evaluation, *J. Geophys. Res.*, 105, 8931–8980, 2000.

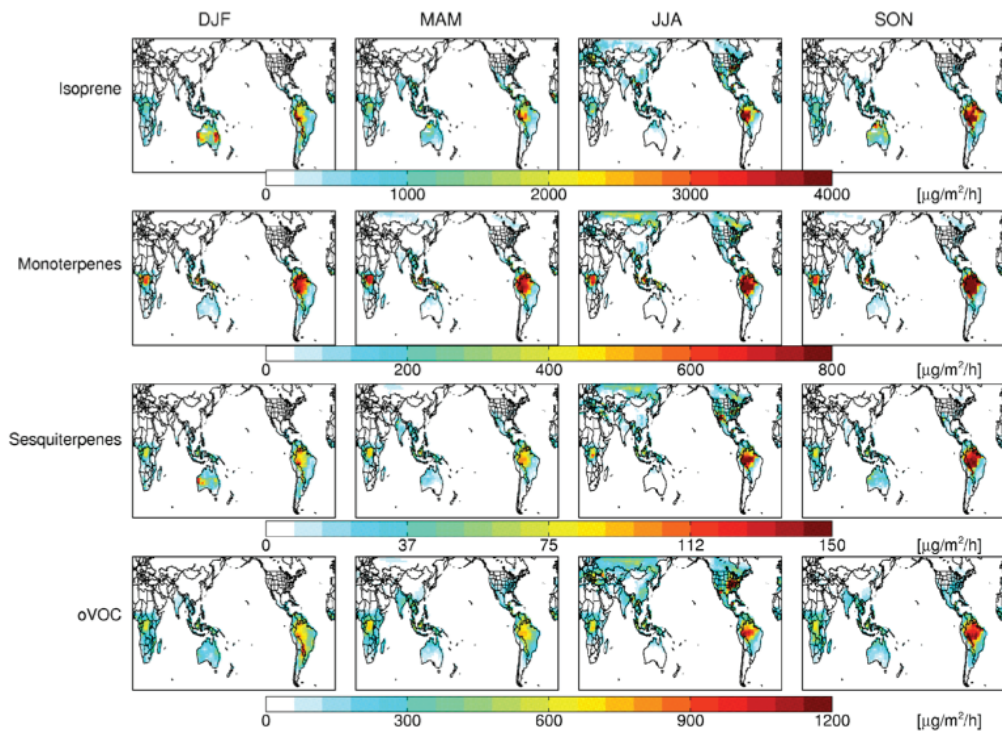


Fig. S1. Volatile organic compound emissions from MEGAN as implemented in CLM, seasonal averages.

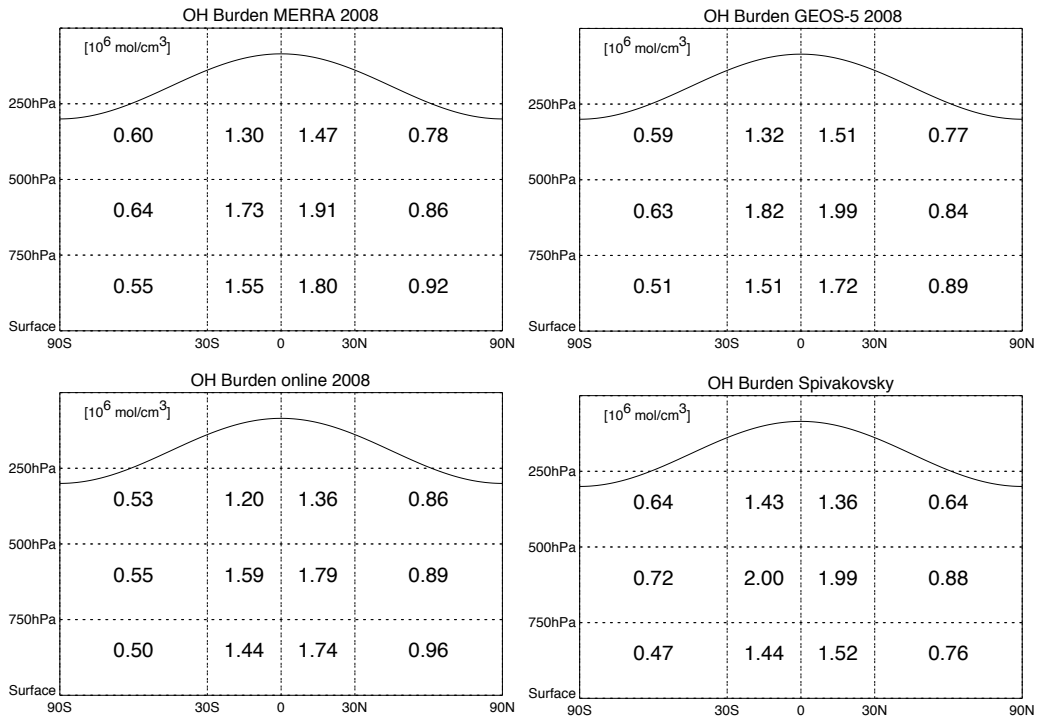


Fig. S3. OH burden in all simulations and in Spivakovsky et al. (2000) dataset, plotted using the recommended approach of methane-reaction weighting in Lawrence et al. (2001).

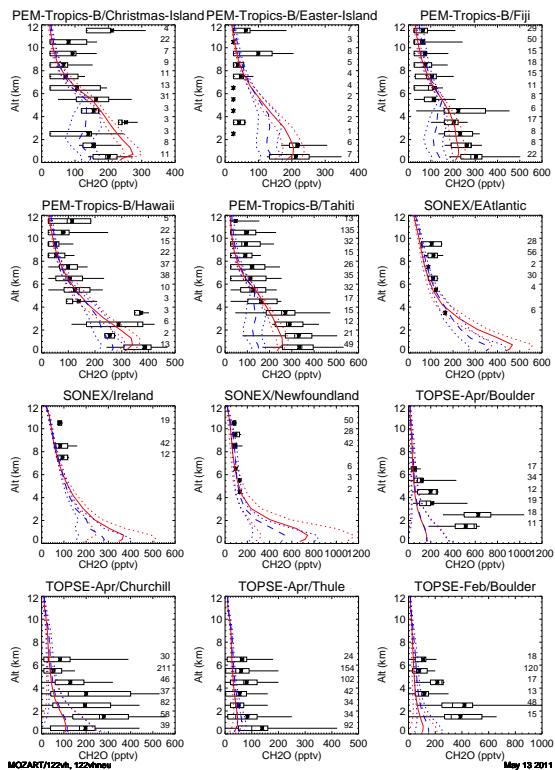


Fig. S4a. Comparison with aircraft formaldehyde observations (Emmons et al., 2000). Observations are in black, model results in red (online stratosphere-troposphere) and blue (online stratosphere-troposphere with the Neu and Prather wet removal scheme). Specific campaign is indicated above each figure.

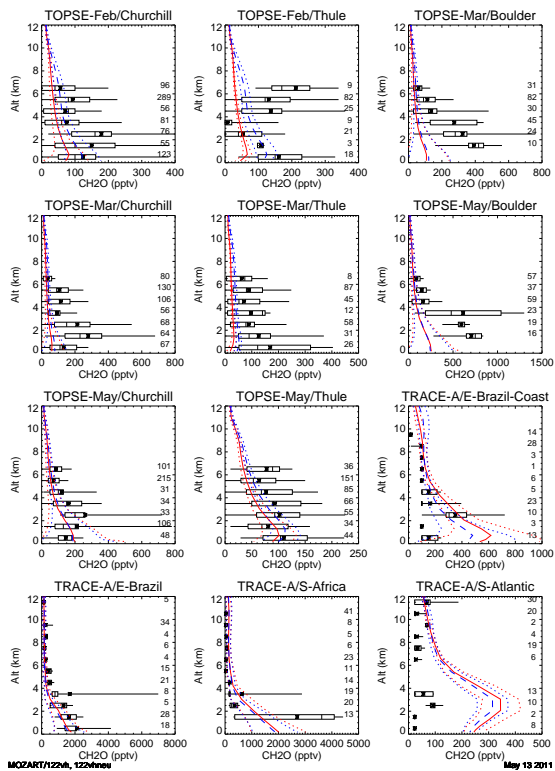
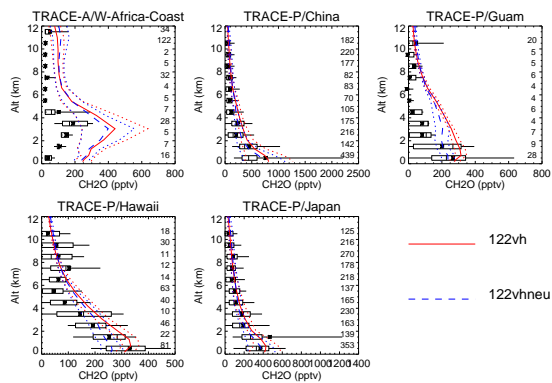


Fig. S4a (continued).



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Fig. S4a (continued).

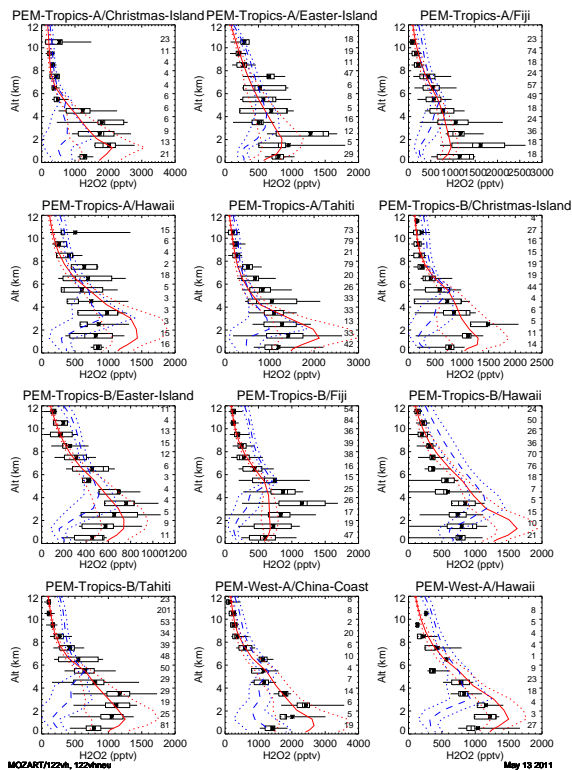


Fig. S4b. Comparison with aircraft hydrogen peroxide observations (Emmons et al., 2000). Observations are in black, model results in red (online stratosphere-troposphere) and blue (online stratosphere-troposphere with the Neu and Prather wet removal scheme). Specific campaign is indicated above each figure.

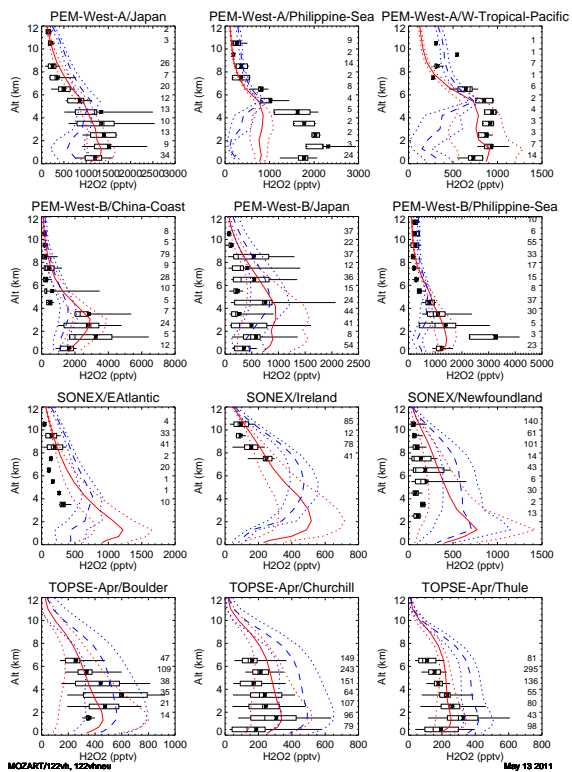


Fig. S4b (continued).

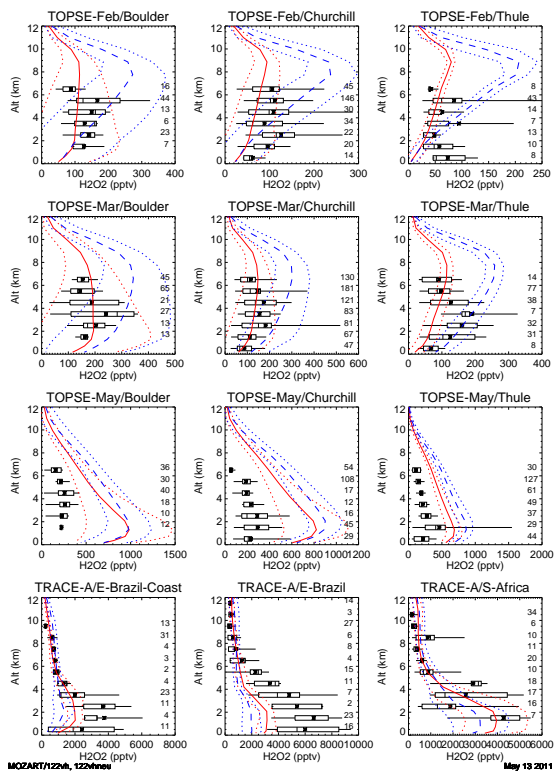
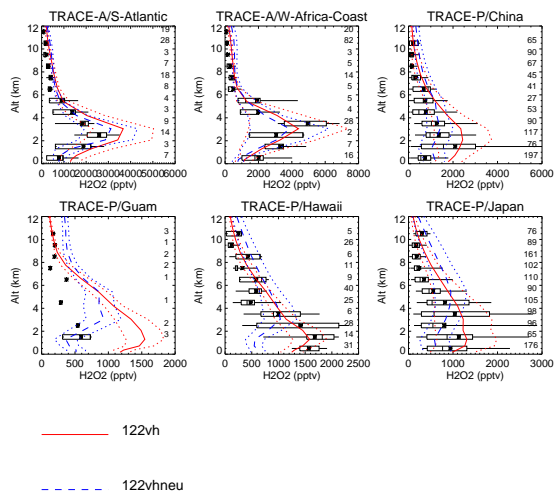


Fig. S4b (continued).



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Fig. S4b (continued).

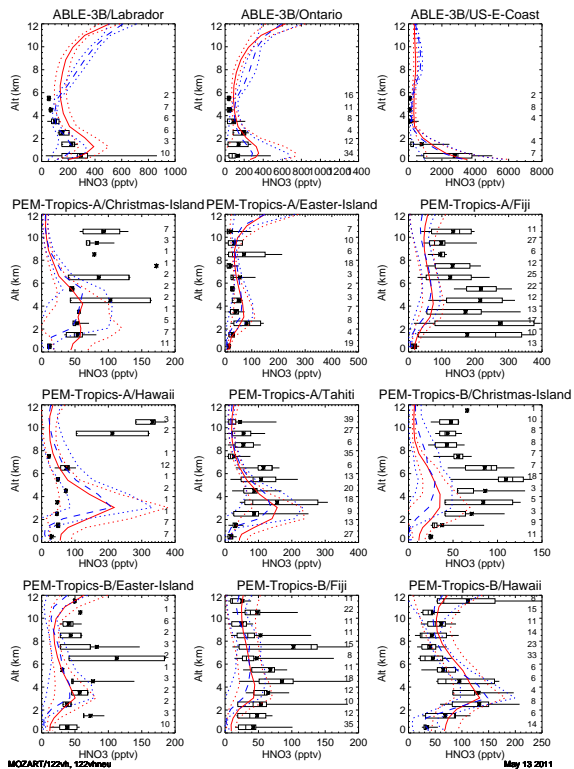


Fig. S4c. Comparison with aircraft nitric acid observations (Emmons et al., 2000). Observations are in black, model results in red (online stratosphere-troposphere) and blue (online stratosphere-troposphere with the Neu and Prather wet removal scheme). Specific campaign is indicated above each figure.

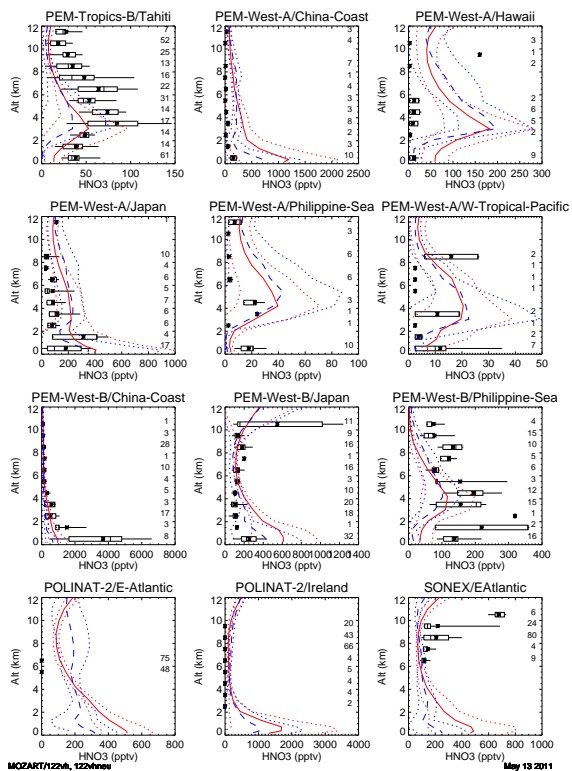


Fig. S4c (continued).

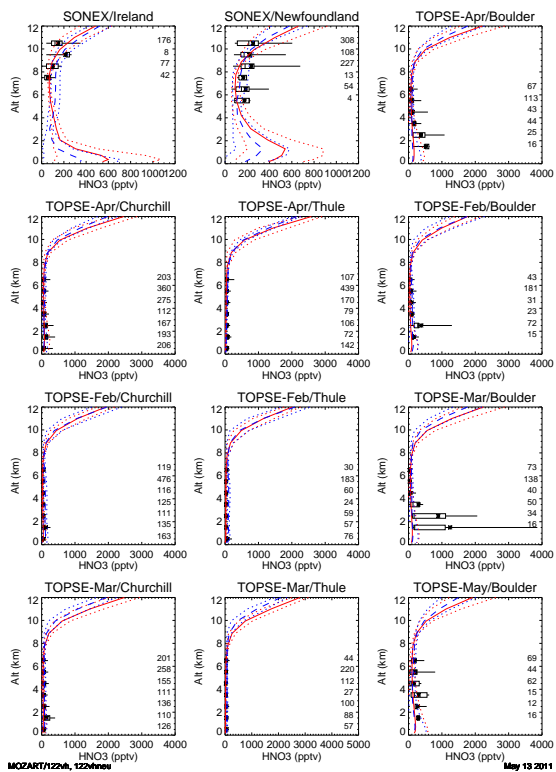


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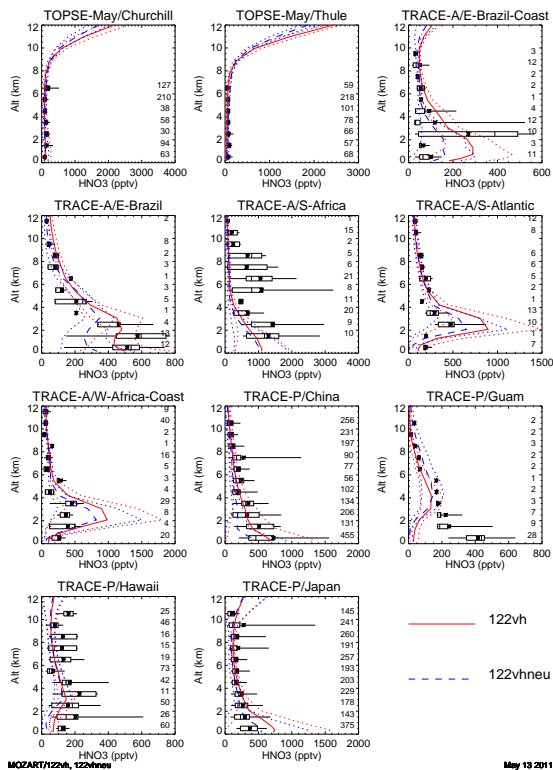


Fig. S4c (continued).

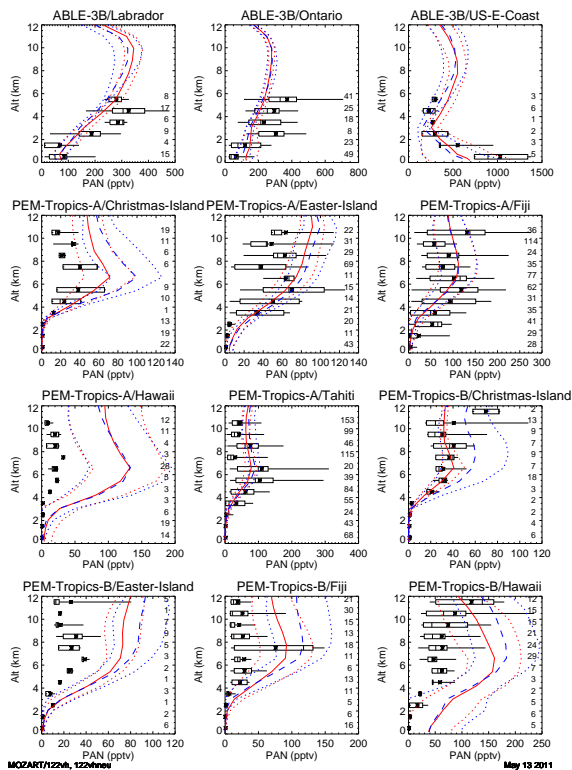


Fig. S4d. Comparison with aircraft peroxyacetyl nitrate (PAN) observations (Emmons et al., 2000). Observations are in black, model results in red (online stratosphere-troposphere) and blue (online stratosphere-troposphere with the Neu and Prather wet removal scheme). Specific campaign is indicated above each figure.

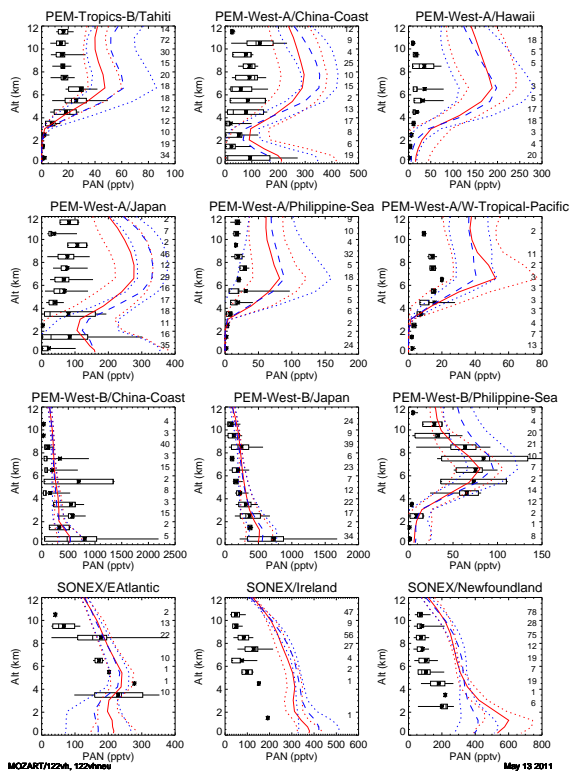


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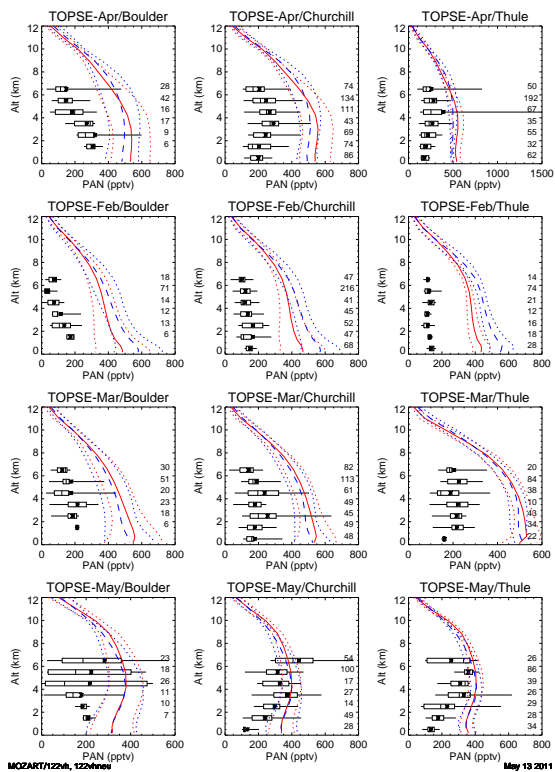
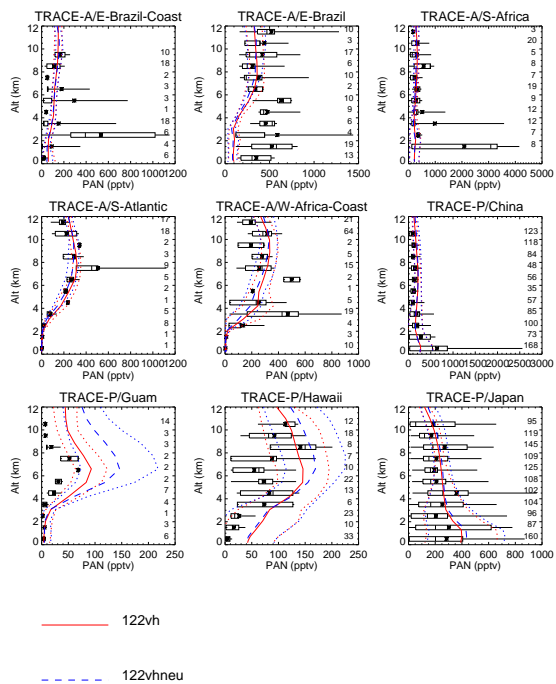


Fig. S4d (continued).



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Fig. S4d (continued).

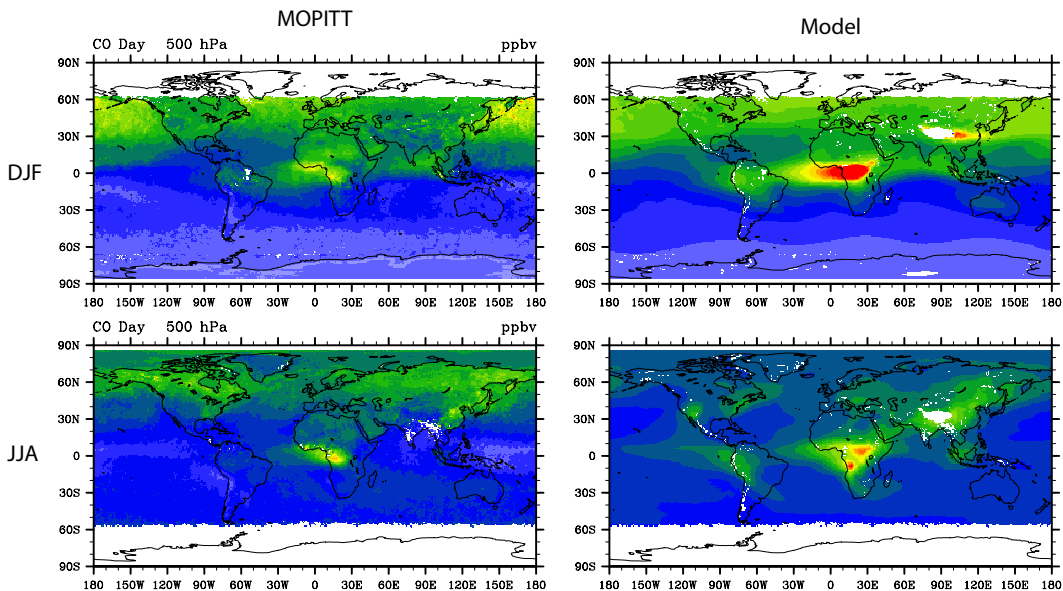


Fig. S5. Comparison of MOPITT (2001-2010) climatology of retrievals at 500 hPa with model results (convoluted with a priori and averaging kernels) for winter (DJF) and summer (JJA). Model results are from the online stratosphere-troposphere simulation averaged over the same period.