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Supplement to “CAM-chem: description and evaluation of interactive atmospheric chemistry in the Community Earth System Model”

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Abstract

In this supplement, we provide additional figures to discuss: 1) regional aggregation of ozone sondes (Figure S1), 2) comparison with ozone sondes (profiles, Figure S2 and seasonal cycles, Figure S3), 3) comparison with the aircraft observations climatology of Emmons et al. (2000) (Figures S4), and 4) tropospheric OH distribution with the Spivakovsky climatology (Spivakovsky et al., 2000) using the Lawrence et al. (2001) diagnostic approach (Figure S5).

1 Introduction

2 Conclusions

References

- Emmons, L. K., D. A. Hauglustaine, J.-F. Müller, M. A. Carroll, G. P. Brasseur, D. Brunner, J. Staehelin, V. Thouret, and A. Marenco: 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.

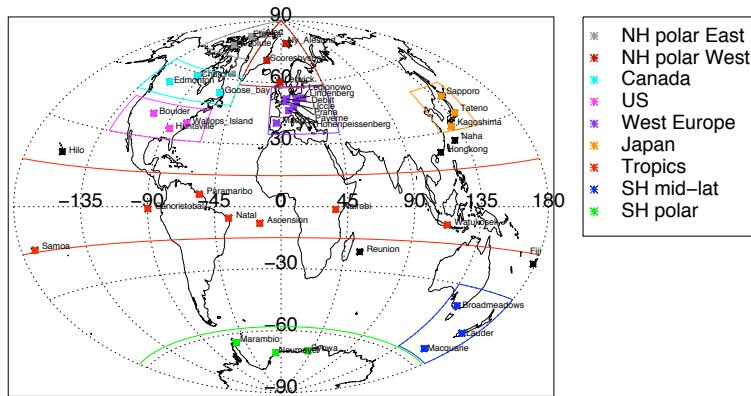


Fig. S1. Regional aggregation of ozonesondes.

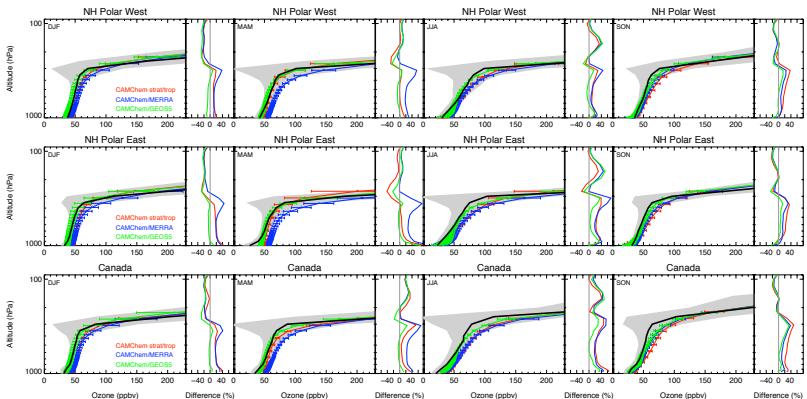


Fig. S2. Regionally-aggregated (see Figure S2 for definition) median ozonesonde profiles for each season (winter, left column; spring, second column; summer, third column, fall; right column). In each panel, the bias with respect to the observation median is shown as relative difference.

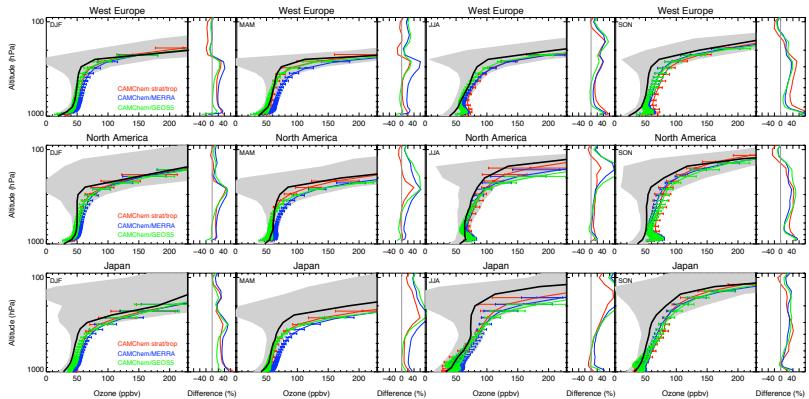


Fig. S2. Continued.

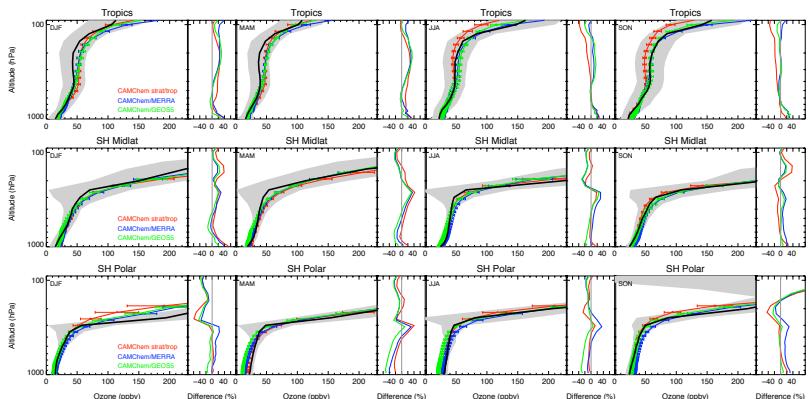


Fig. S2. Continued

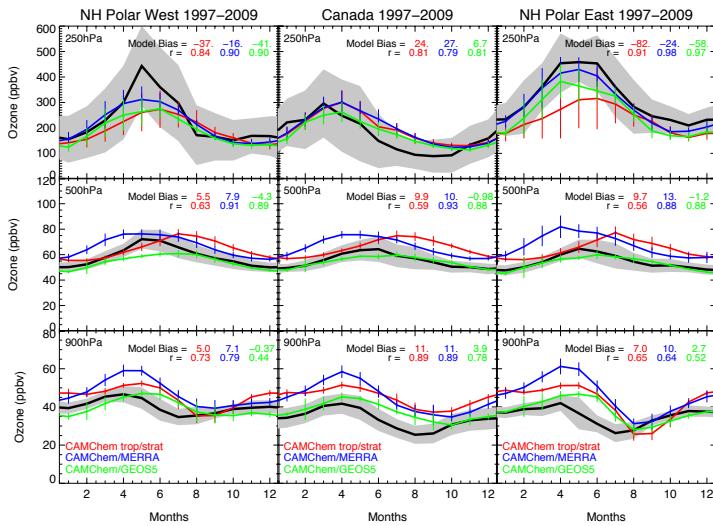


Fig. S3. Comparison of the mean seasonal cycle for regionally-aggregated stations. Observations and model simulations cover 1997-2009, except for the GEOS5 simulation which starts in 2004.

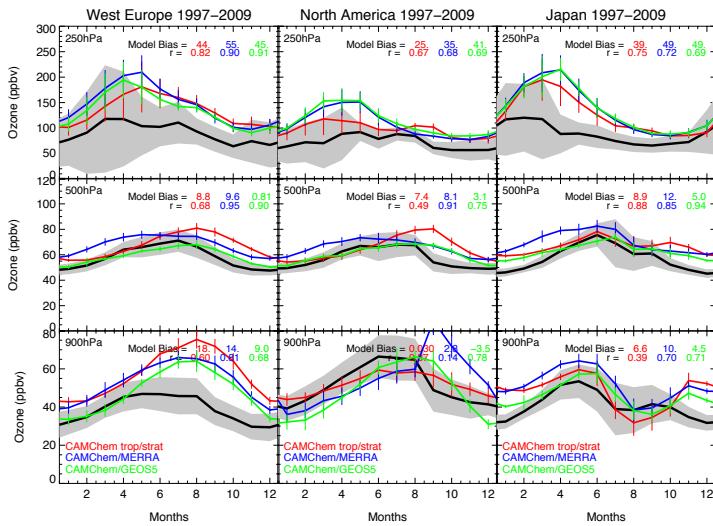


Fig. S3. Continued.

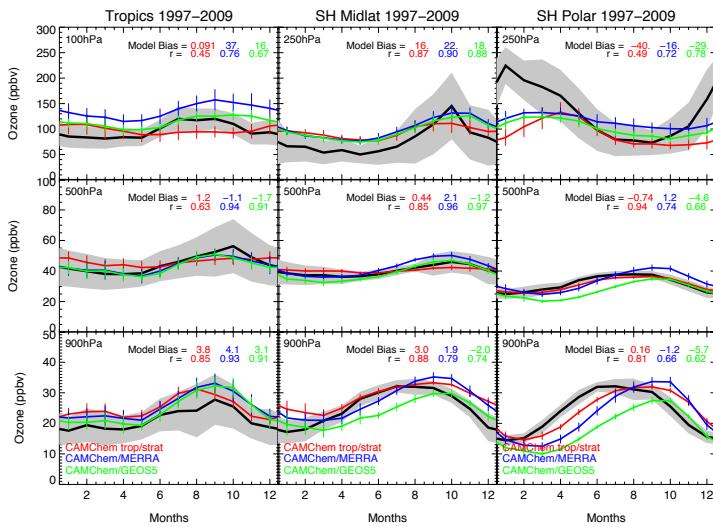


Fig. S3. Continued

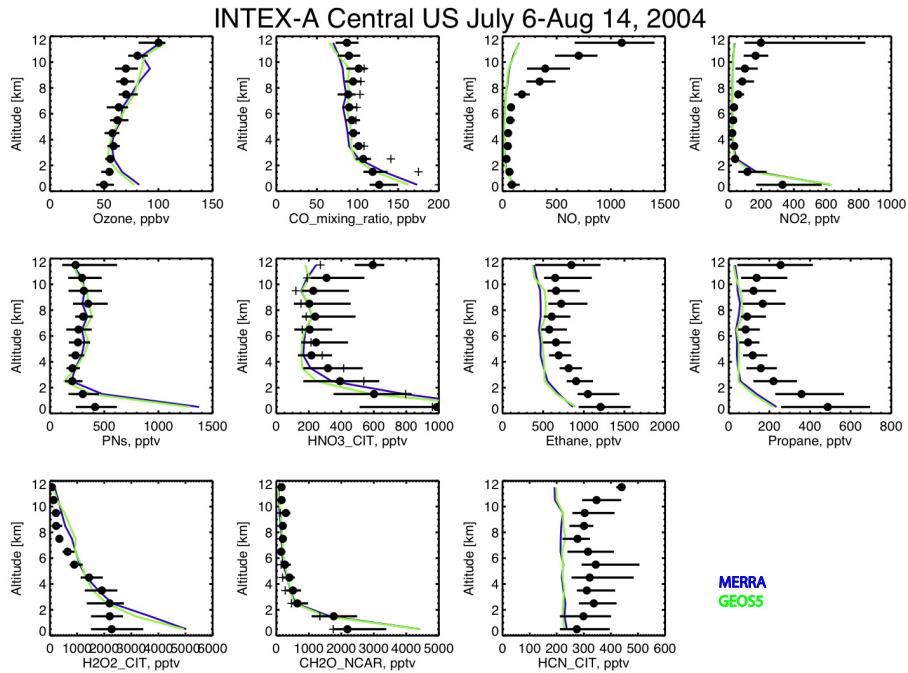


Fig. S4a. Comparison of specified-dynamics simulations with INTEX-A Central US for selected aircraft observations. All flights in the considered period are aggregated and variability is shown as horizontal line.

INTEX-A DC-8 Eastern US July 6-Aug 14, 2004

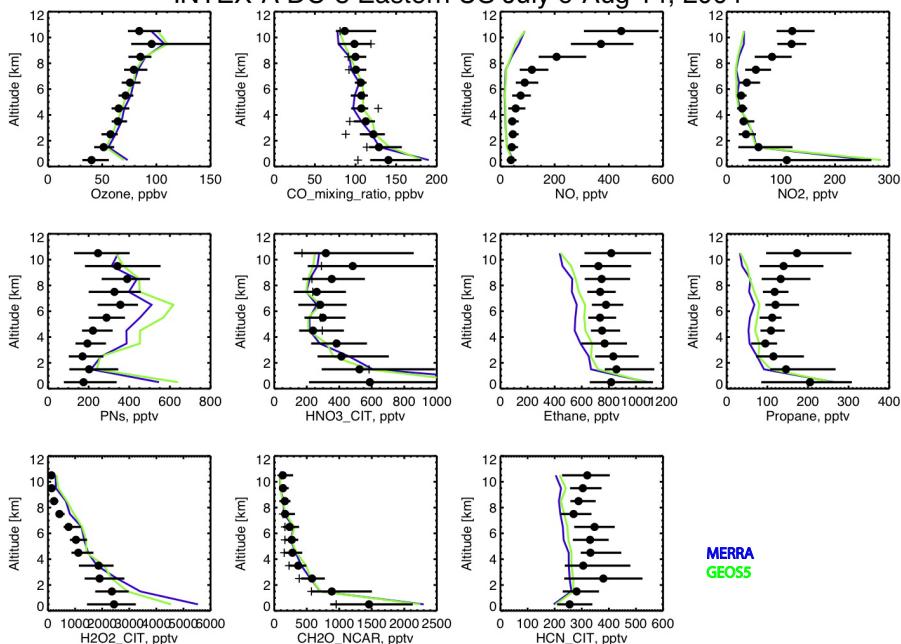


Fig. S4b. Same as Fig. S4a but for INTEX-A Eastern US.

INTEX-B DC-8 Alaska Apr 17-May 15, 2006

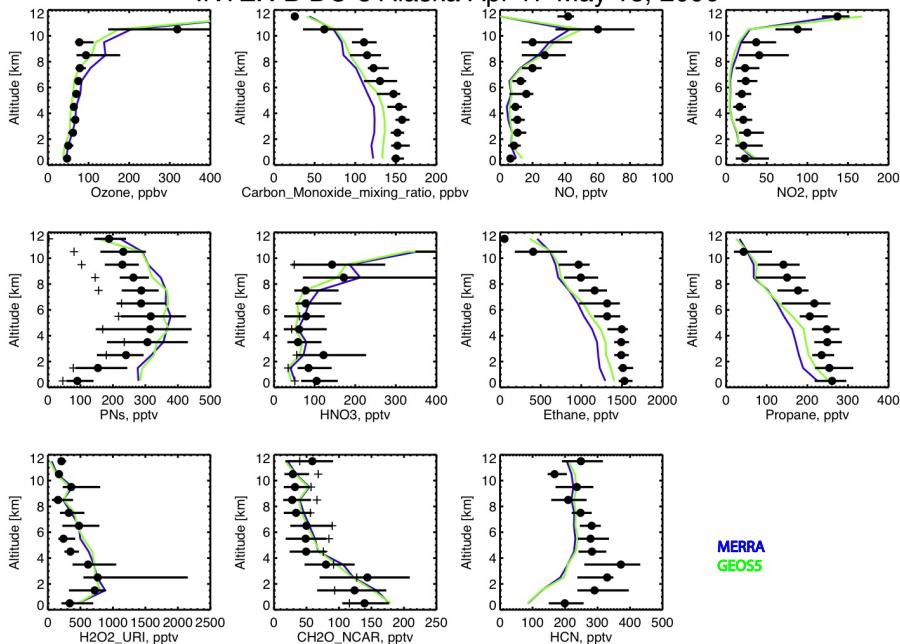


Fig. S4c. Same as Fig. S4a but for INTEX-B Alaska observations..

INTEX-B DC-8 Hawaii Apr 17-May 15, 2006

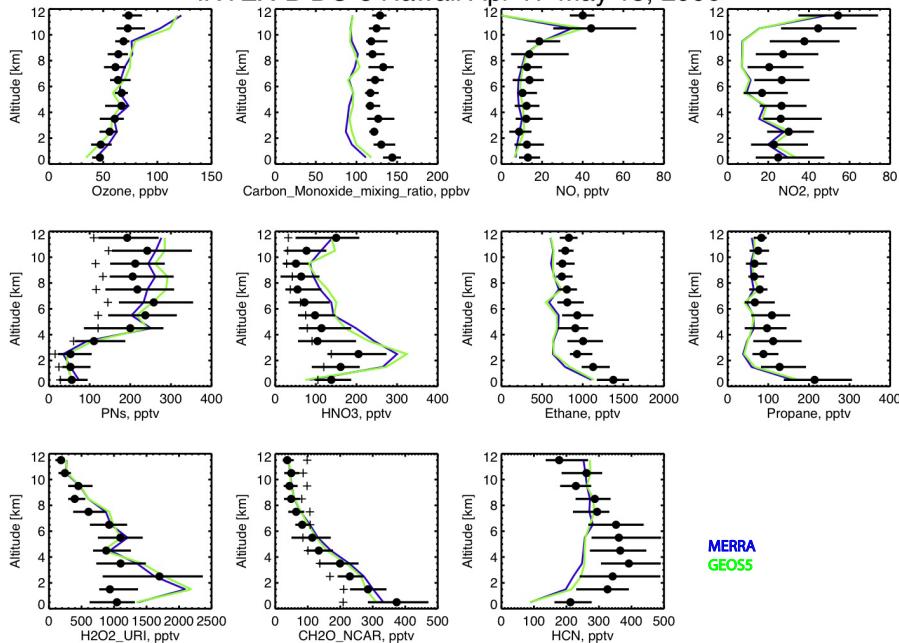


Fig. S4d. Same as Fig. S4a but for INTEX-B Hawaii observations..

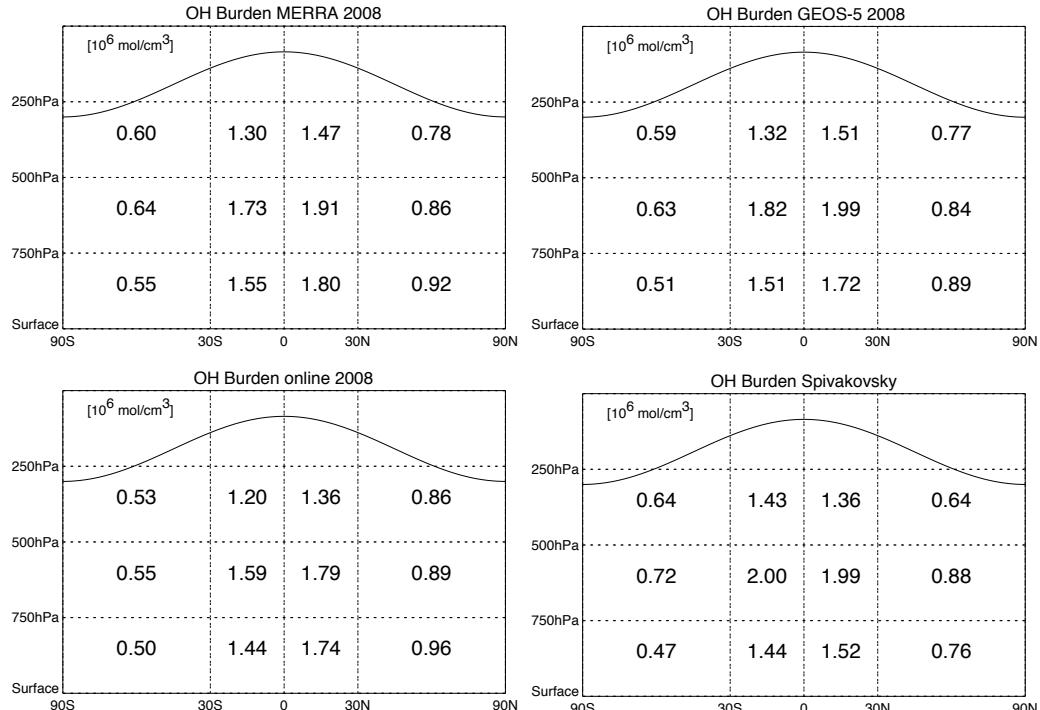


Fig. S5. OH burden in all simulations and in Spivakovsky et al. (2000) dataset, plotted using the recommended approach of methane-reaction weighting in Lawrence et al. (2001).