

SUPPLEMENTARY INFORMATION

Transport mechanisms for synoptic, seasonal and interannual variations of SF₆ and ‘age’ of air in troposphere

Prabir K. Patra¹, Masayuki Takigawa¹, Geoff S. Dutton², Karin Uhse³, Kentaro Ishijima¹, Benjamin Lintner⁴, Kazuyuki Miyazaki¹ and James W. Elkins²

1. Frontier Research Center for Global Change, JAMSTEC, Yokohama 236 001, Japan

2. NOAA Earth System Research Laboratory, Boulder, CO 80305, USA

3. Umweltbundesamt - Federal Environment Agency, D-63225 Langen, Germany

4. AOS/IGPP, University of California Los Angeles, Los Angeles, CA 90095-1565, USA

Here we show some additional comparisons of SF₆ simulations using MOZART (Gloor et al., 2007), this study using ACTM and observed data.

In this study we used the latitudinal profiles of SF₆ from 6 continuous monitoring sites only, while there are weekly flask samplings from many other sites as discussed in Gloor et al. (2007). Since the focus of this study is not validation of model transport, but to understand the various transport processes contributing to the synoptic, seasonal and inter-hemispheric gradients in SF₆, we show these model-data comparison for growing confidence in the SF₆ simulation quality by ACTM.

Figure S1 shows the comparisons of SF₆ inter-hemispheric gradients, obtained from measurements and model simulation, at 39 flask sampling sites during the years 1999 & 2000 in addition to the 6 continuous monitoring sites used in this work.

Figure S2 shows a comparison of SF₆ time series at two sites at the PBL height region (0-2 km) and upper troposphere (6-8 km).

These two comparisons suggest an overall agreement in ACTM simulation and data at different latitude and height regions.

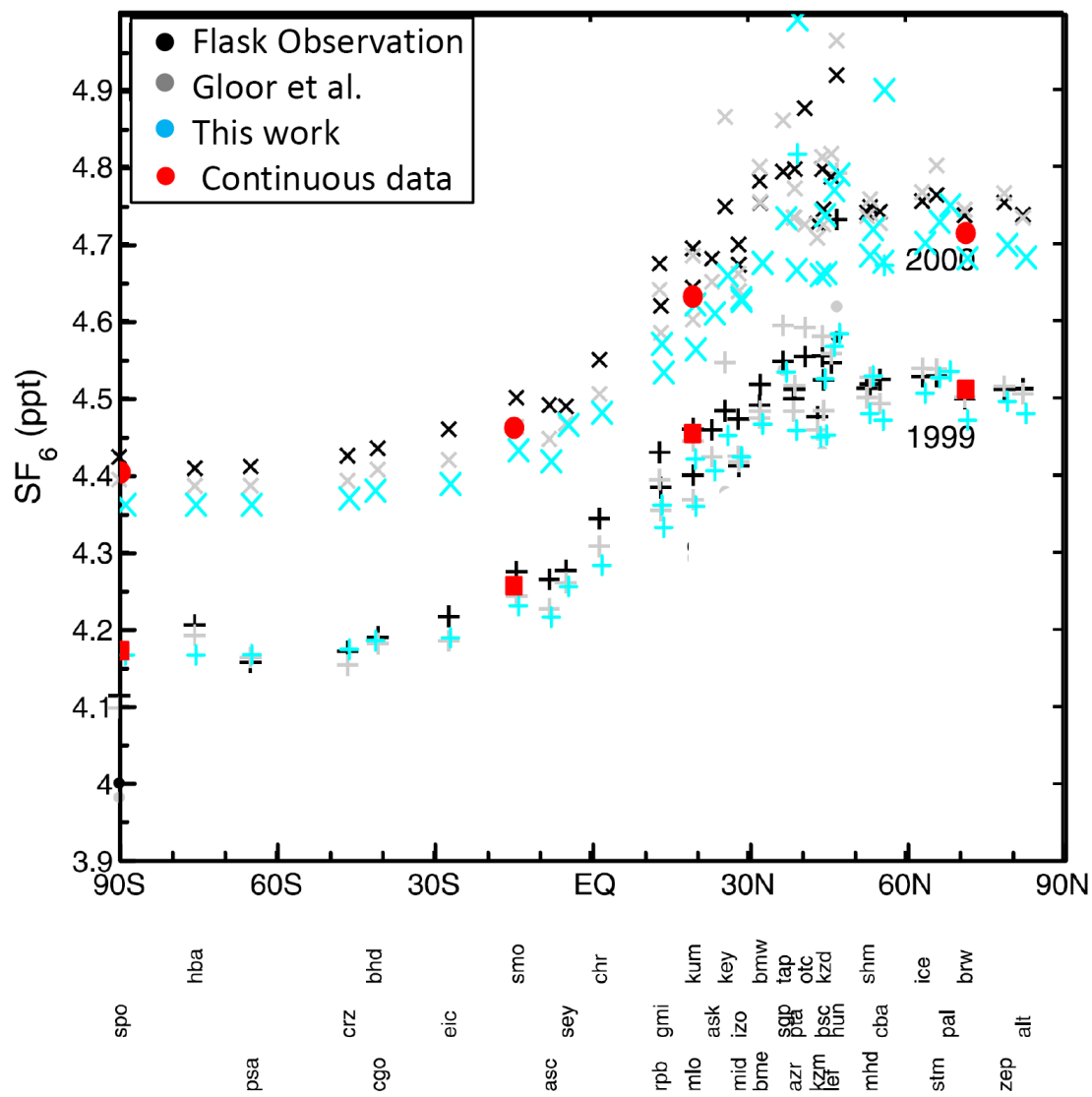


Figure S1: Comparison of inter-hemispheric gradient in SF₆ as observed at flask sampling and continuous sites with those obtained using MOZART (Gloor et al., 2007) and ACTM forward transport simulations. The flask observations are made by the NOAA ESRL GMD Carbon Cycle Cooperative Global Air Sampling Network (www.esrl.noaa.gov/gmd/ccgg).

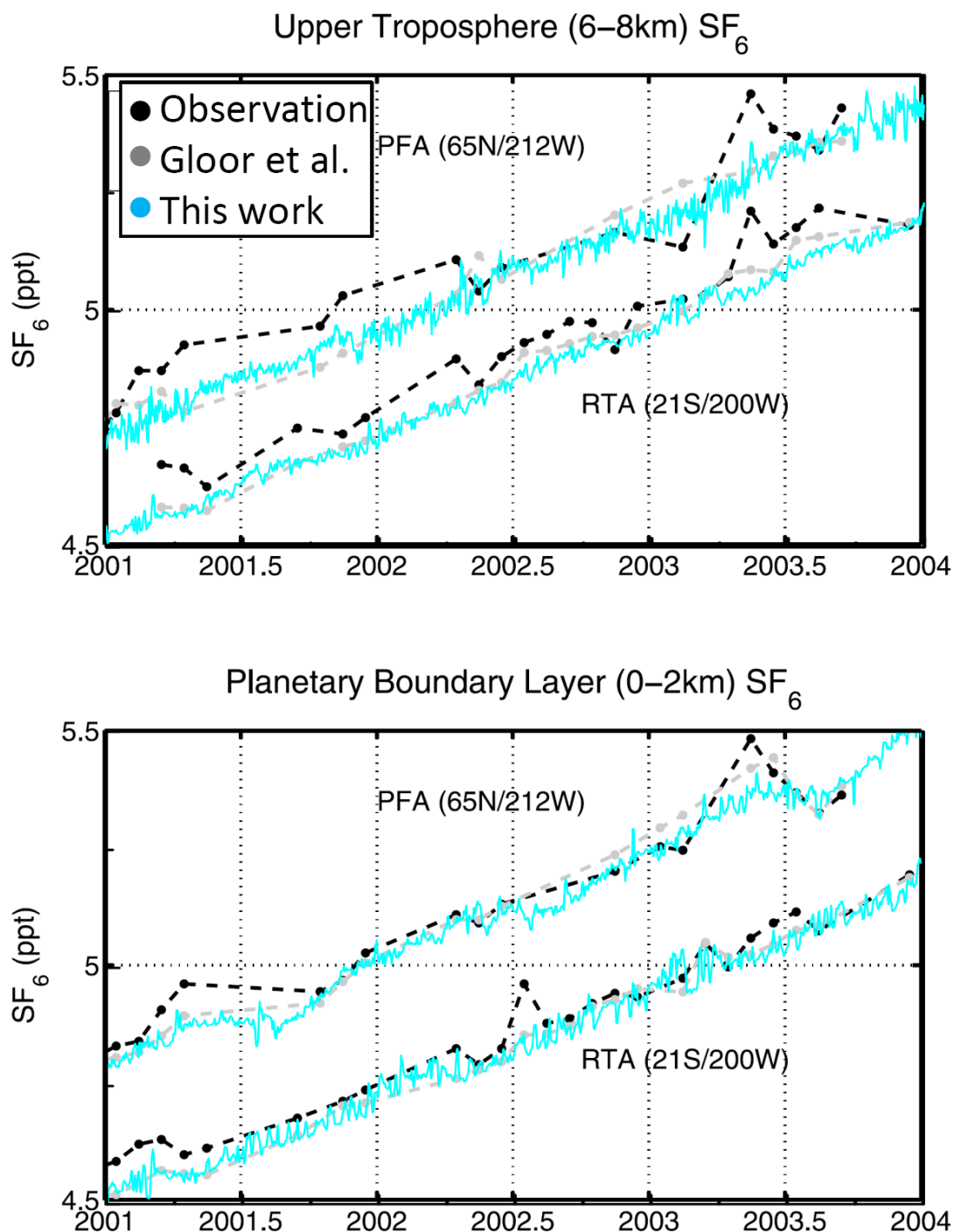


Figure S2: Comparison of SF₆ time series at PFA (65.07°N, 147.29°W) and RTA (21.25°S, 159.83°W) sites at lower (bottom panel) and upper (top panel) tropospheric heights as obtained from measurements, MOZART (Gloor et al., 2007) and ACTM forward simulations. The flask observations are made by the NOAA ESRL GMD Carbon Cycle Cooperative Global Air Sampling Network (www.esrl.noaa.gov/gmd/ccgg).