Supporting Information for "Quantifying the Impact of Atmospheric Transport Uncertainty on CO_2 Surface Flux Estimates"

Andrew E. Schuh [1], Andrew R. Jacobson [2], Sourish Basu[2], Brad Weir[3], David Baker[1], Kevin Bowman[4], Frédéric Chevallier[5], Sean Crowell[6], Kenneth J. Davis[7], Feng Deng[8], Scott Denning[9], Liang Feng[10,11], Dylan Jones[8], Junjie Liu[4], and Paul I. Palmer[10,11]

[1]Cooperative Institute for Research in the Atmosphere, Colorado State University [2]University of Colorado and NOAA Earth System Research Laboratory [3]Global Modeling and Assimilation Office, NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA [4]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA [5]Laboratoire des Sciences du Climat et de l'Environnement, CEACNRSUVSQ, L'Orme des Merisiers, GifsurYvette, France [6]School of Meteorology, University of Oklahoma, Norman, OK 73072, USA [7]Department of Meteorology and Atmospheric Science, Penn State University, University Park, PA, USA [8]Department of Physics, University of Toronto, Toronto, ON, Canada [9]Department of Atmospheric Sciences, Colorado State University, Fort Collins, CO, USA [10]School of GeoSciences, University of Edinburgh, Edinburgh, UK [11]National Centre for Earth Observation, Edinburgh, UK

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Introduction This SI contains three items. A table (Table 1) of the stations for which SF6 observatoins were available for the analysis in the manuscript, along with a figure (Figure S1) showing their locations globally. Additionally, Figure S2 shows the model vertical levels for the two transport models being discussed in the manuscript.

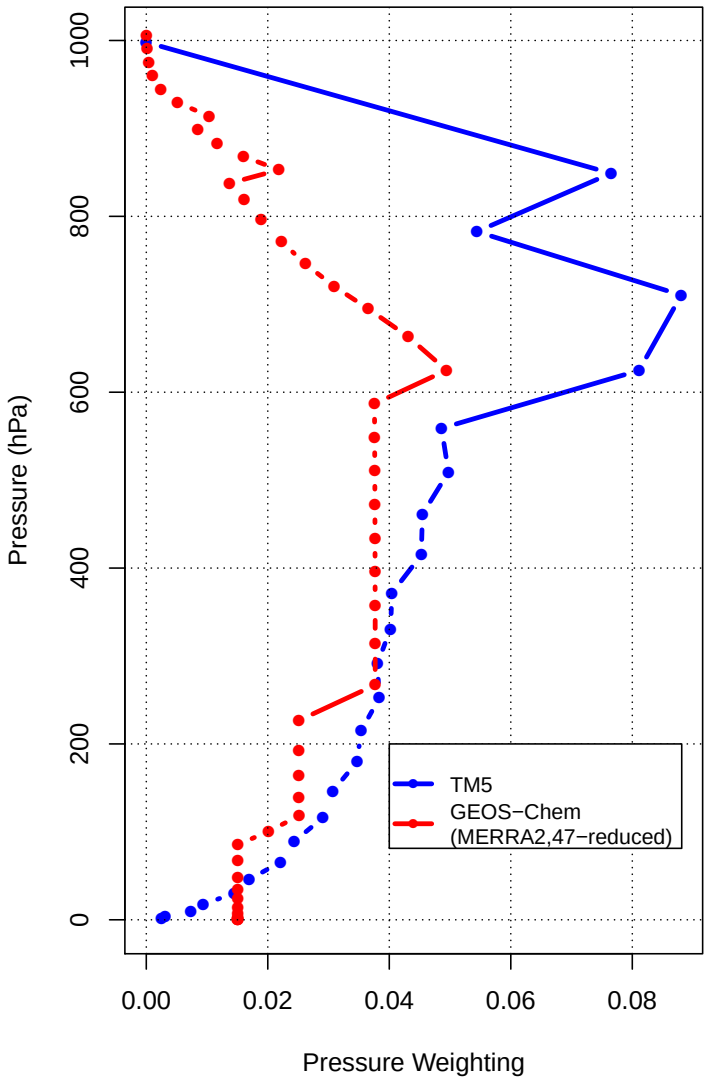

Figure S1. Weights as a function model level, i.e. portion of the total column pressure for each model level. This plot shows the formulation for TM5 with 25 levels and GEOS-Chem's MERRA2 reduced 47 level formulation. GEOS-Chem appears to have less total pressure but this is only because the vertical pressure grid has about twice as many levels therefore the relative percentage of the atmosphere in each layer is about half of that of TM5 on average.

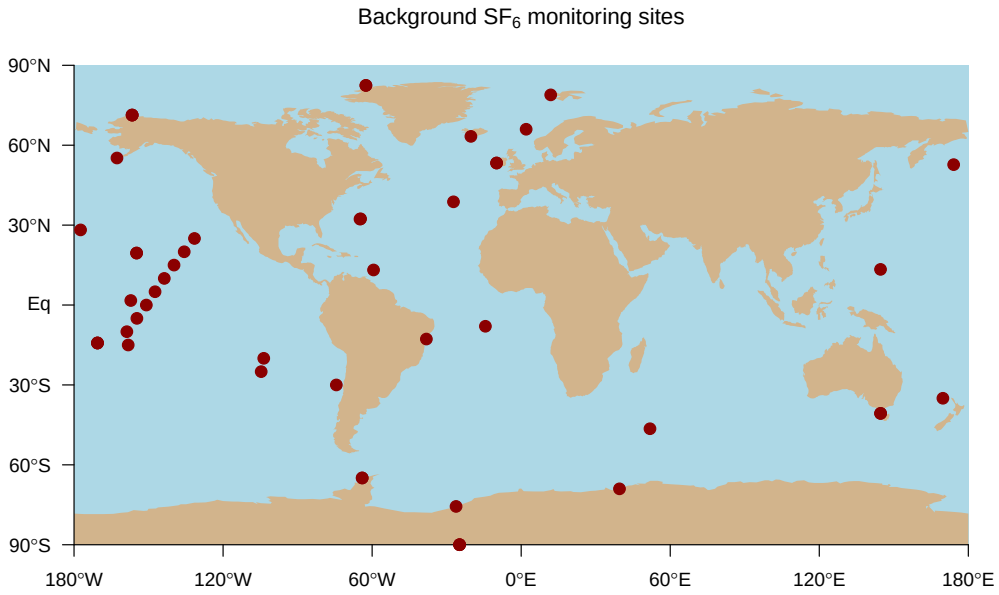

Figure S2. Map of SF_6 Marine Boundary Layer (MBL) sites used in SF_6 analysis.

Table S1: List of marine boundary layer sampling sites for SF6

Site	Latitude	Platform	Laboratory
South Pole	89.98°S	surface flask	HATS
South Pole	89.98°S	surface quasi-continuous	HATS
South Pole	89.97°S	surface flask	CCGG
Halley Bay, Antarctica	75.61°S	surface flask	CCGG
Syowa, Antarctica	69.00°S	surface flask	CCGG
Palmer Station, Antarctica	64.92°S	surface flask	HATS
Palmer Station, Antarctica	64.92°S	surface flask	CCGG
Crozet Island	46.43°S	surface flask	CCGG
Cape Grim, Tasmania	40.68°S	surface flask	HATS
Cape Grim, Tasmania	40.68°S	surface flask	CCGG
Pacific Ocean	35.00°S	shipboard flask	CCGG
Pacific Ocean	30.00°S	shipboard flask	CCGG
Pacific Ocean	25.00°S	shipboard flask	CCGG
Pacific Ocean	20.00°S	shipboard flask	CCGG
Pacific Ocean	15.00°S	shipboard flask	CCGG
Tutuila, American Samoa	14.25°S	surface flask	HATS
Tutuila, American Samoa	14.25°S	surface quasi-continuous	HATS
Tutuila, American Samoa	14.24°S	surface flask	CCGG
Arembepe, Brazil	12.77°S	surface flask	CCGG
Pacific Ocean	10.00°S	shipboard flask	CCGG
Ascension Island	7.97°S	surface flask	CCGG
Pacific Ocean	5.00°S	shipboard flask	CCGG
Pacific Ocean	0.00°N	shipboard flask	CCGG
Christmas Island, Republic of Kiribati	1.70°N	surface flask	CCGG
Pacific Ocean	5.00°N	shipboard flask	CCGG
Pacific Ocean	10.00°N	shipboard flask	CCGG
Ragged Point, Barbados	13.16°N	surface flask	CCGG
Mariana Islands, Guam	13.39°N	surface flask	CCGG
Pacific Ocean	15.00°N	shipboard flask	CCGG
Cape Kumukahi, Hawaii	19.52°N	surface flask	CCGG
Cape Kumukahi, Hawaii	19.52°N	surface flask	HATS
Pacific Ocean	20.00°N	shipboard flask	CCGG
Pacific Ocean	25.00°N	shipboard flask	CCGG
Sand Island, Midway	28.21°N	surface flask	CCGG
Tudor Hill, Bermuda	32.26°N	surface flask	CCGG
St. Davids Head, Bermuda	32.37°N	surface flask	CCGG
Terceira Island, Azores	38.76°N	surface flask	CCGG
Shemya Island, Alaska	52.72°N	surface flask	CCGG
Mace Head, Ireland	53.32°N	surface flask	CCGG
Mace Head, Ireland	53.33°N	surface flask	HATS
Cold Bay, Alaska	55.20°N	surface flask	CCGG

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Site	Latitude	Platform	Laboratory
Storhofdi, Iceland	63.33°N	surface flask	CCGG
Ocean Station M	66.00°N	surface flask	CCGG
Barrow, Alaska	71.32°N	surface flask	CCGG
Barrow, Alaska	71.32°N	surface flask	HATS
Barrow, Alaska	71.32°N	surface quasi-continuous	HATS
Ny-Alesund, Svalbard	78.91°N	surface flask	CCGG
Alert, Canada	82.45°N	surface flask	CCGG
Alert, Canada	82.45°N	surface flask	HATS

Table S1: List of marine boundary layer sampling sites for SF_6