

Supplementary material to paper:

**Ethane, ethyne and carbon monoxide concentrations in the upper troposphere and lower stratosphere from ACE and GEOS-Chem: a comparison study**

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Table S1. Average CO VMR profiles for the period January 2004 – February 2007 in 10° latitude bins from ACE satellite measurements in ppbv

Altitude (km)	Latitude (Degrees)																	
	90°S- 80°S	80°S- 70°S	70°S- 60°S	60°S- 50°S	50°S- 40°S	40°S- 30°S	30°S- 20°S	20°S- 10°S	10°S- 0°	0°- 10°N	10°N- 20°N	20°N- 30°N	30°N- 40°N	40°N- 50°N	50°N- 60°N	60°N- 70°N	70°N- 80°N	80°N- 90°N
5.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
6.5	58	62	68	72	81	92	92	83	85	90	110	116	110	119	136	137	140	117
7.5	54	62	66	71	78	91	91	85	94	95	103	107	111	121	126	127	127	118
8.5	51	62	65	74	82	96	88	89	92	94	101	110	115	120	119	117	111	110
9.5	38	51	54	65	78	91	88	91	93	100	96	102	107	106	93	91	79	89
10.5	29	40	44	54	71	82	81	84	88	97	93	94	94	84	69	66	57	65
11.5	25	32	36	45	61	74	78	80	84	88	88	85	82	67	50	48	41	43
12.5	23	26	30	37	50	61	65	65	68	71	72	70	61	47	38	35	31	34
13.5	20	23	27	32	41	53	57	59	61	57	63	55	47	39	31	30	26	28
14.5	18	20	24	28	35	46	53	55	58	53	51	47	40	34	27	26	23	25
15.5	15	17	21	24	31	41	48	44	46	51	49	45	37	31	24	23	20	21
16.5	14	16	18	20	26	33	37	7	19	39	----	34	30	26	20	19	17	18
17.5	15	15	16	17	21	25	28	14	1	14	----	26	24	21	18	17	15	16
18.5	15	15	15	15	17	21	23	19	20	----	----	21	21	18	16	15	14	15

Table S2. Average C<sub>2</sub>H<sub>6</sub> VMR profiles for the period January 2004 – February 2007 in 10° latitude bins from ACE satellite measurements in ppbv

Altitude (km)	Latitude (Degrees)																	
	90°S- 80°S	80°S- 70°S	70°S- 60°S	60°S- 50°S	50°S- 40°S	40°S- 30°S	30°S- 20°S	20°S- 10°S	10°S- 0°	0°- 10°N	10°N- 20°N	20°N- 30°N	30°N- 40°N	40°N- 50°N	50°N- 60°N	60°N- 70°N	70°N- 80°N	80°N- 90°N
5.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
6.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
7.5	0.254	0.257	0.263	0.315	0.443	0.319	0.337	----	----	----	----	0.901	0.740	1.054	1.034	1.115	1.244	0.871
8.5	0.257	0.251	0.266	0.327	0.389	0.566	0.436	0.428	0.422	0.679	0.631	0.718	0.804	0.907	0.918	0.944	0.921	0.770
9.5	0.166	0.201	0.225	0.313	0.399	0.553	0.402	0.439	0.462	0.577	0.560	0.651	0.760	0.814	0.749	0.726	0.629	0.612
10.5	0.099	0.147	0.175	0.263	0.382	0.510	0.450	0.440	0.466	0.532	0.549	0.650	0.694	0.625	0.510	0.454	0.390	0.438
11.5	0.070	0.094	0.131	0.188	0.304	0.405	0.401	0.429	0.451	0.421	0.519	0.515	0.500	0.397	0.306	0.268	0.231	0.312
12.5	0.057	0.068	0.109	0.155	0.250	0.344	0.348	0.355	0.380	0.406	0.421	0.414	0.372	0.252	0.201	0.169	0.134	0.209
13.5	0.036	0.054	0.091	0.124	0.198	0.298	0.316	0.306	0.300	0.303	0.334	0.330	0.244	0.188	0.140	0.115	0.086	0.161
14.5	0.022	0.038	0.071	0.103	0.154	0.225	0.252	0.229	0.240	0.232	0.257	0.234	0.171	0.137	0.097	0.077	0.056	0.116
15.5	0.011	0.024	0.045	0.067	0.111	0.157	----	0.035	0.201	0.199	0.158	0.160	0.119	0.100	0.066	0.051	0.034	0.067
16.5	0.007	0.014	0.025	0.041	0.070	0.096	----	0.113	0.076	----	----	0.108	0.081	0.063	0.040	0.031	0.020	0.035
17.5	0.008	0.011	0.015	0.022	0.041	0.058	----	0.073	----	0.051	----	0.071	0.049	0.038	0.024	0.020	0.016	0.020
18.5	0.010	0.010	0.012	0.014	0.022	0.041	0.044	----	----	----	----	0.050	0.035	0.025	0.016	0.016	0.018	0.012

Table S3. Average C<sub>2</sub>H<sub>2</sub> VMR profiles for the period January 2004 – February 2007 in 10° latitude bins from ACE satellite measurements in ppbv

Altitude (km)	Latitude (Degrees)																	
	90°S- 80°S	80°S- 70°S	70°S- 60°S	60°S- 50°S	50°S- 40°S	40°S- 30°S	30°S- 20°S	20°S- 10°S	10°S- 0°	0°- 10°N	10°N- 20°N	20°N- 30°N	30°N- 40°N	40°N- 50°N	50°N- 60°N	60°N- 70°N	70°N- 80°N	80°N- 90°N
5.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
6.5	-----	0.047	0.088	0.140	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.242	0.222	0.271	0.096
7.5	0.047	0.034	0.054	0.076	0.102	-----	-----	-----	-----	-----	-----	-----	0.130	0.158	0.180	0.184	0.239	0.088
8.5	0.036	0.033	0.043	0.050	0.059	0.110	0.084	0.115	0.091	0.130	0.116	0.127	0.109	0.139	0.148	0.148	0.177	0.105
9.5	0.025	0.026	0.035	0.048	0.060	0.091	0.068	0.075	0.077	0.096	0.095	0.098	0.099	0.109	0.107	0.104	0.109	0.088
10.5	0.015	0.018	0.026	0.039	0.055	0.078	0.068	0.071	0.070	0.088	0.082	0.084	0.085	0.086	0.068	0.064	0.061	0.050
11.5	0.007	0.011	0.016	0.026	0.039	0.051	0.050	0.052	0.056	0.052	0.056	0.056	0.062	0.050	0.038	0.033	0.027	0.033
12.5	0.008	0.009	0.012	0.018	0.029	0.038	0.041	0.036	0.040	0.044	0.040	0.045	0.042	0.030	0.024	0.019	0.017	0.018
13.5	0.010	0.007	0.010	0.014	0.021	0.029	0.031	0.030	0.028	0.035	0.032	0.031	0.028	0.020	0.015	0.013	0.012	0.009
14.5	0.008	0.007	0.009	0.012	0.017	0.024	0.026	0.027	0.027	0.035	0.031	0.029	0.021	0.016	0.012	0.010	0.010	0.014
15.5	0.008	0.007	0.008	0.010	0.013	0.019	0.025	0.023	0.024	0.022	0.023	0.023	0.018	0.014	0.010	0.008	0.008	0.011
16.5	0.008	0.006	0.006	0.007	0.010	0.015	0.021	0.021	0.020	0.016	0.016	0.019	0.013	0.009	0.008	0.006	0.007	0.008
17.5	0.007	0.004	0.005	0.006	0.007	0.011	0.016	0.018	0.016	0.015	0.013	0.014	0.010	0.007	0.005	0.005	0.006	0.009
18.5	0.006	0.004	0.005	0.005	0.005	0.008	0.012	0.013	0.013	0.014	0.012	0.011	0.007	0.006	0.004	0.004	0.005	0.007

2005 CO GEOS-Chem total emissions

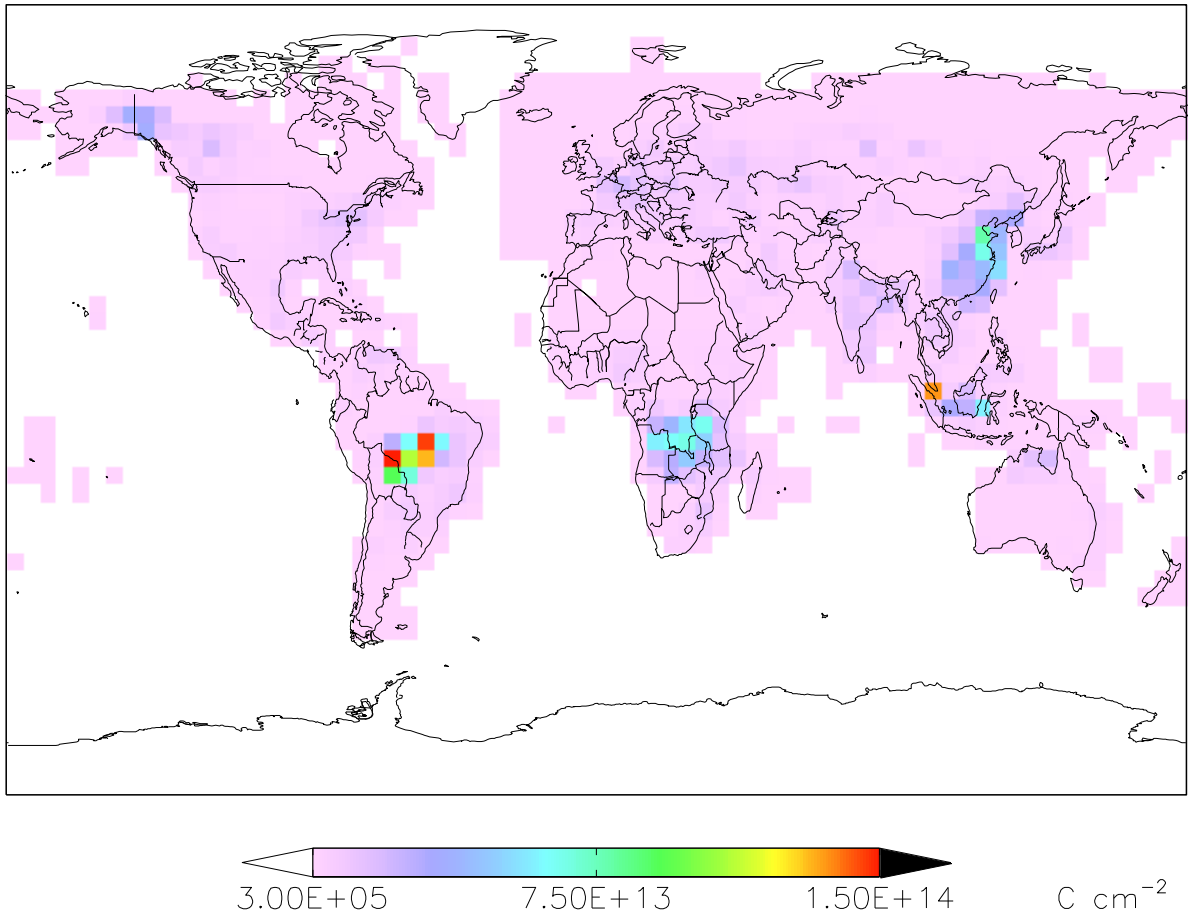


Fig. S1. 2005 CO global emissions including CO production from VOCs oxidation

2005 C<sub>2</sub>H<sub>6</sub> GEOS-Chem total emissions

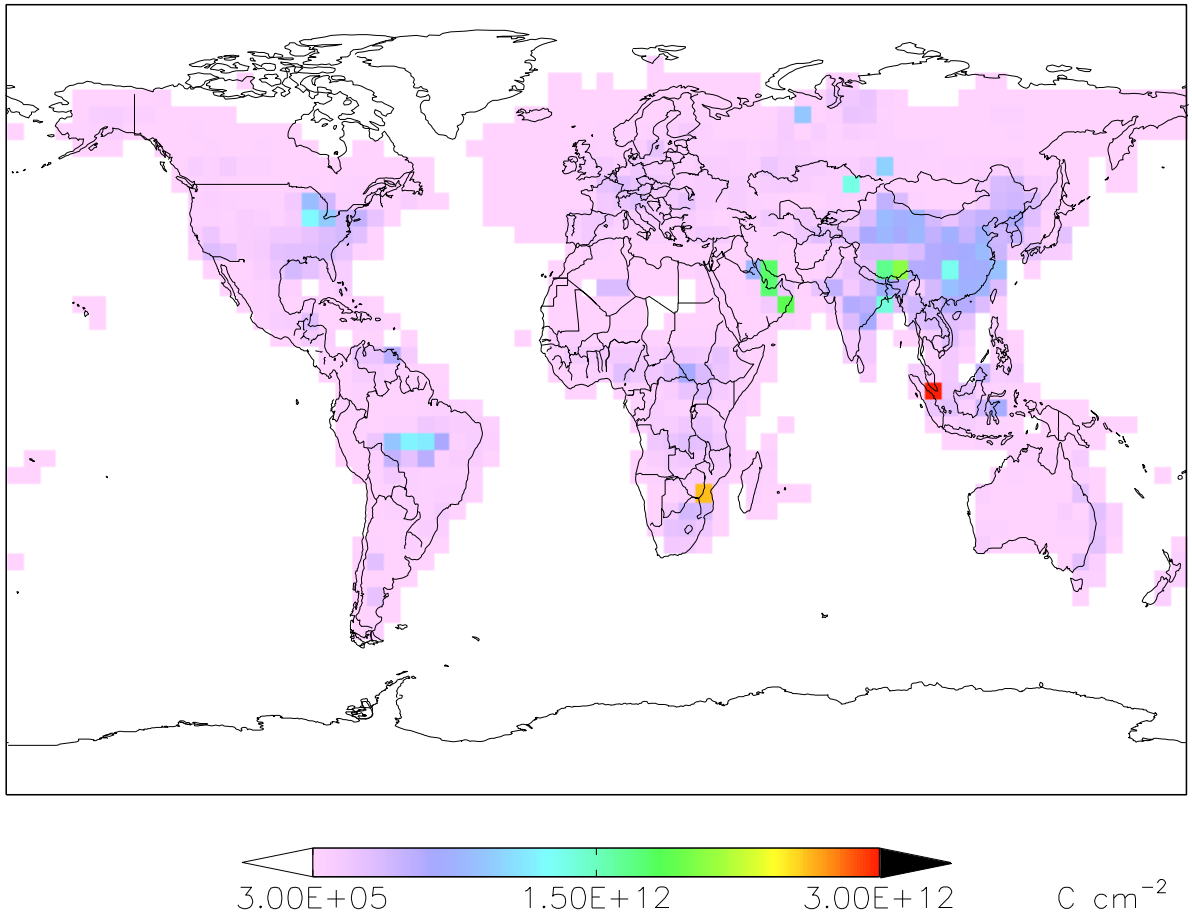


Fig. S2. 2005 C<sub>2</sub>H<sub>6</sub> global emissions

2005 C<sub>2</sub>H<sub>2</sub> GEOS-Chem total emissions

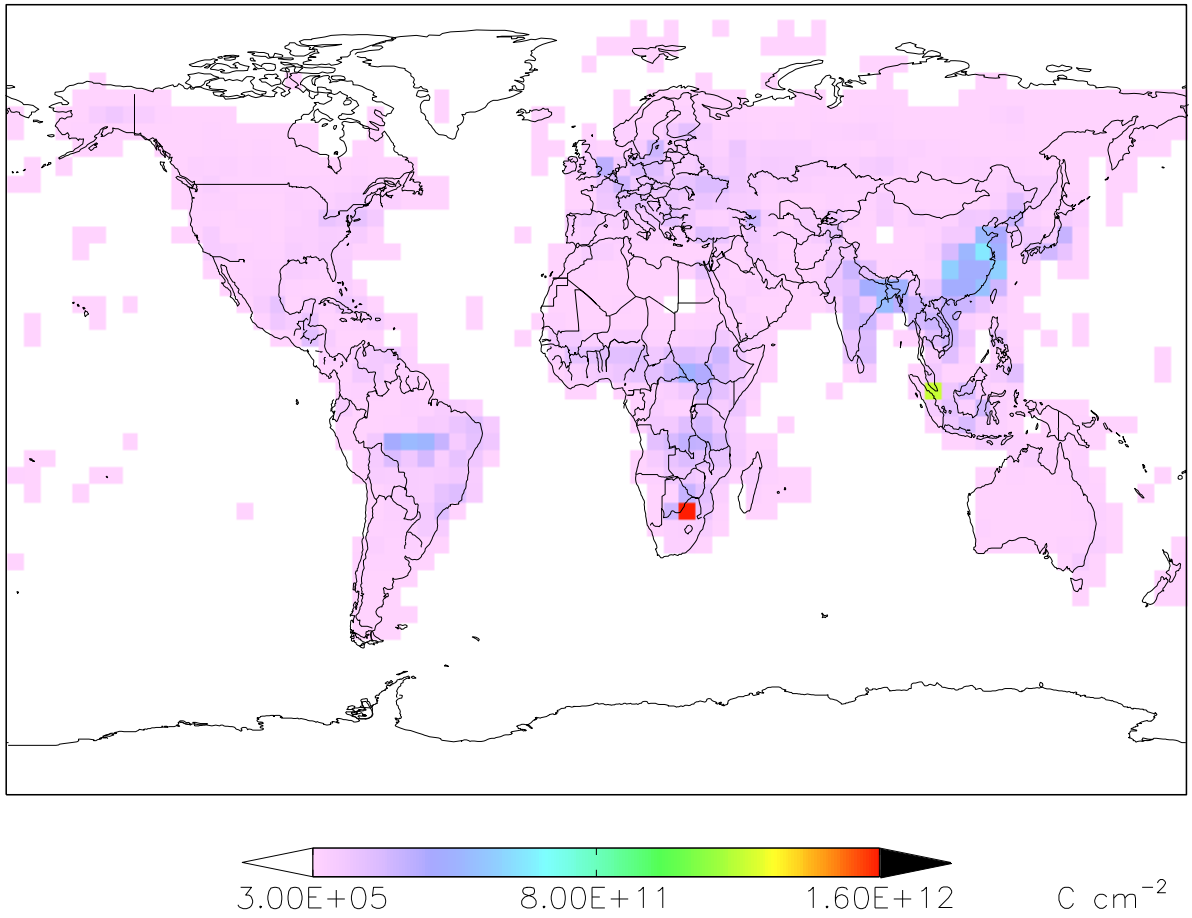


Fig. S3. 2005 C<sub>2</sub>H<sub>2</sub> global emissions

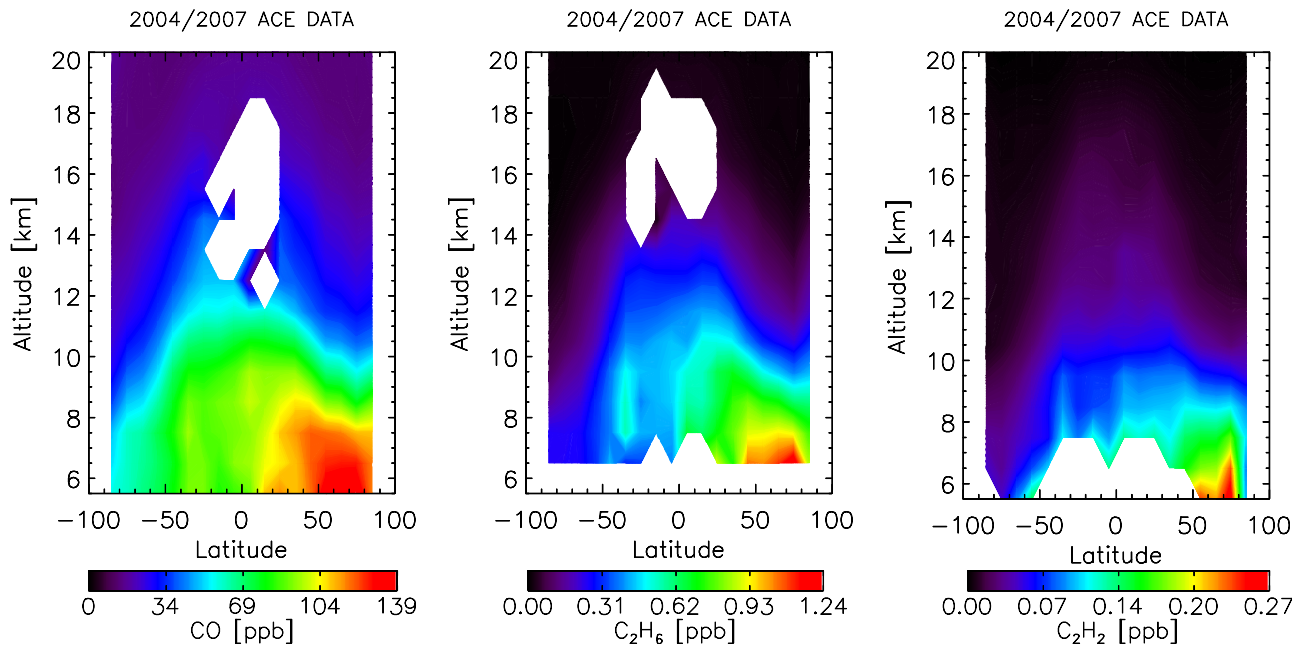


Fig. S4. Concentrations altitude-latitude cross sections for ACE data for the period of time between February 2004 and February 2007