Supplementary Tables

Table S 1: Selection of effective Henry law coefficients (H^*) used in TM5-MP for the MOGUNTIA chemical scheme.

Trace gas	H* (M atm^{-1})	$\Delta H\ R^{-1}$ (K)	Reference
CH_3OOH, *n*-C_3H_7OOH, *i*-C_3H_7OOH, CH_3COCH_2OH, C_4H_9OOH, MEKOOH, ISOPOOH, MVKOOH, MACROOH	2.9×10^2	5200	1
CH_3ONO_2,	2.0	4700	1
CH_3OONO_2	2.0	4700	1
HCHO	3.2×10^3	6800	1
CH_3OH	2.0×10^2	5600	1
HCOOH	8.8×10^3	6100	1
CH_3CH_2OOH	3.3	6000	1
$CH_3CH_2ONO_2$	1.6	5400	1
$HOCH_2CH_2OOH$	1.7×10^6	9700	1
$HOCH_2CH_2ONO_2$	3.9×10^4		1
CH_3CHO	13	5900	1
CH_3COOH	8.3×10^2	5300	1
$HOCH_2CHO$	4.1×10^4	4600	1
CHOCHO	4.19×10^5	7500	1
CH_3CH_2OH	190	6400	1
CH_3COOH	4.0×10^3	6200	1
n-$C_3H_7ONO_2$	1.1	5500	1
i-$C_3H_7ONO_2$	0.78	5400	1
HOC_3H_6OOH	1.7×10^6	9700	1
CH_3COCH_3	27	5500	1
CH_3CH_2CHO	9.9	4300	1
CH_3COCHO	3.2×10^3	7500	1
$CH_3C(O)COOH$	3.1×10^5	5100	1
$C_4H_9ONO_2$	1	5800	1
MEK	18	5700	1
$MEKONO_2$	0.7	5200	1
$CH_3COCOCH_3$	73	5700	1
$ISOPONO_2$, $MACRONO_2$, $MVKONO_2$	1.7×10^4	9200	2
IEPOX	9.1×10^4	6600	3
HPALD	2.3		1
MVK	26	4800	1
MACR	4.8	4300	1

[1] Sander (2015) and references therein

[2] Ito et al. (2007) for all biogenic hydroxy nitrates

[3] Browne et al. (2014), as for H_2O_2

Table S 2: Soil, water, snow/ice and mesophyl resistances (s m^{-1}) used in TM5-MP for the CB05 and MOGUNTIA chemical schemes.

Trace gas	r_{soil}	r_{wat}	$r_{snow/ice}$	r_{mes}	r_{cut}
O_3	400	2000	2000	1	10^5
CO	5000	10^5	10^5	5000	10^5
NO	10^5	10^5	10^5	500	10^5
NO_2/NO_3	600	3000	3000	1	10^5
HNO_3/N_2O_5	1	1	1	1	1
H_2O_2, IEPOX	80	72	80	1	10^5
SO_2	100	1	1	1	10^5
CH_3ONO_2, CH_3OONO_2, $CH_3C(O)OONO_2$, *n*-$C_3H_7ONO_2$, *i*-$C_3H_7ONO_2$, $C_4H_9ONO_2$, $MEKONO_2$, $ISOPONO_2$	3994	295	3394	1	10^5
CH_3CHO, C_2H_5CHO, $CH_3C(O)CH_3$, $CH_3C(O)C(O)CH_3$, $HOCH_2C(O)CH_3$, MEK, MVK, MACR, HPALD	10^5	300	10^5	200	10^5
HCHO, CH_3COCHO, CHOCHO, $HOCH_2CHO$,	1666	254	1666	1	10^5
CH_3OOH, CH_3OH, HCOOH, CH_3CH_2OOH, CH_3CH_2OH, CH_3COOH, n-C_3H_7OOH, i-C_3H_7OOH, $CH_3C(O)CH_2OOH$, *n*-C_3H_7OOH, *i*-C_3H_7OOH, HOC_3H_6OOH, $CH_3C(O)COOH$, C_4H_9OOH, MEKOOH, MVKOOH, MACROOH, $CH_3C(O)OOH$, ISOPOOH	3650	293	3650	1	10^5
NH_3	100	1	10^5	1	10^5

Table S 3: TM5-MP performance calculations of the mCB05(EBI), mCB05(KPP) and MOGUNTIA configurations for the different components, i.e. transport (advection in the x-, y- and z-directions along with the vertical transport), the chemistry as well as all other procedures contribution simulated years per day (SYPD), and the core-hours per simulated years (CHPSY) using a) 360 cores, and b) 450 cores. Timings are in seconds changes are in %. In parentheses, the runtime and the SYPD without the meteorology reading are also presented. All simulations have been perfor in the ECMWF CRAY XC40 high-performance computer facility.

a)

360 cores / Configuration	Transport					Chemistry	Other	Runtime	SYPD	Cl
	Adv_x	Adv_y	Adv_z	Vertical	Total					
CB05(EBI)	1322	948	165	364	2799	3338	3925	10062 (6723)	0.73 (1.10)	1
CB05(KPP)	1312	934	165	362	2773	5301	4222	12296 (9105)	0.60 (0.81)	1
MOGUNTIA	1892	1303	233	527	3955	8230	4680	16865 (13556)	0.44 (0.54)	2
% solver changes	-1%	-1%	0%	-1%	-1%	-1%	59%	8% (35%)	-18% (-26%)	
% chemistry scheme changes	44%	40%	41%	46%	43%	43%	55%	11% (49%)	-27% (-33%)	4

b)

450 cores / Configuration	Transport					Chemistry	Other	Runtime	SYPD	Cl
	Adv_x	Adv_y	Adv_z	Vertical	Total					
CB05(EBI)	1268	860	138	292	2558	2639	3687	8884 (5696)	0.83 (1.30)	1
CB05(KPP)	1292	853	133	300	2578	4320	4079	10977 (7733)	0.67 (0.95)	1
MOGUNTIA	1806	1126	193	423	3548	6526	4376	14450 (11211)	0.51 (0.65)	2
% solver changes	2%	-1%	-4%	3%	1%	64%	11%	24% (36%)	-19% (-27%)	2
% chemistry scheme changes	40%	32%	45%	41%	38%	51%	7%	32% (45%)	-24% (-32%)	3

Supplementary Equations

Statistics Formulas: Correlation coefficient (R; Eq. S1), mean normalized bias (MNB; Eq. S2), root mean square error (RMSE; Eq. S3), mean normalized error (MNE; Eq. S4) and standard error (STD; Eq. S5) values have been calculated to compare the model calculations, where *O_i* and *P_i* stand for observations and predictions respectively and N is the number of pairs (observations, predictions) that are compared.

$$R = \left[\frac{\frac{1}{N}\sum_{i=1}^{N}\left(O_i - \overline{O}\right)\left(P_i - \overline{P}\right)}{\sigma_O \sigma_P} \right] \quad \text{(Eq. S1)}$$

$$NMB = \frac{\sum_{i=1}^{N}\left(M_i - O_i\right)}{\sum_{i=1}^{N} O_i} \times 100 \quad \text{(Eq. S2)}$$

$$RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N}\left(P_i - O_i\right)^2} \quad \text{(Eq. S3)}$$

$$NME = \frac{\sum_{i=1}^{N}\left|M_i - O_i\right|}{\sum_{i=1}^{N} O_i} \times 100 \quad \text{(Eq. S4)}$$

$$STD = \frac{\sqrt{\frac{1}{N}\sum_{i=1}^{N}(O_i - \overline{O})^2}}{\sqrt{N}} \quad \text{(Eq. S5)}$$

Supplementary Figures

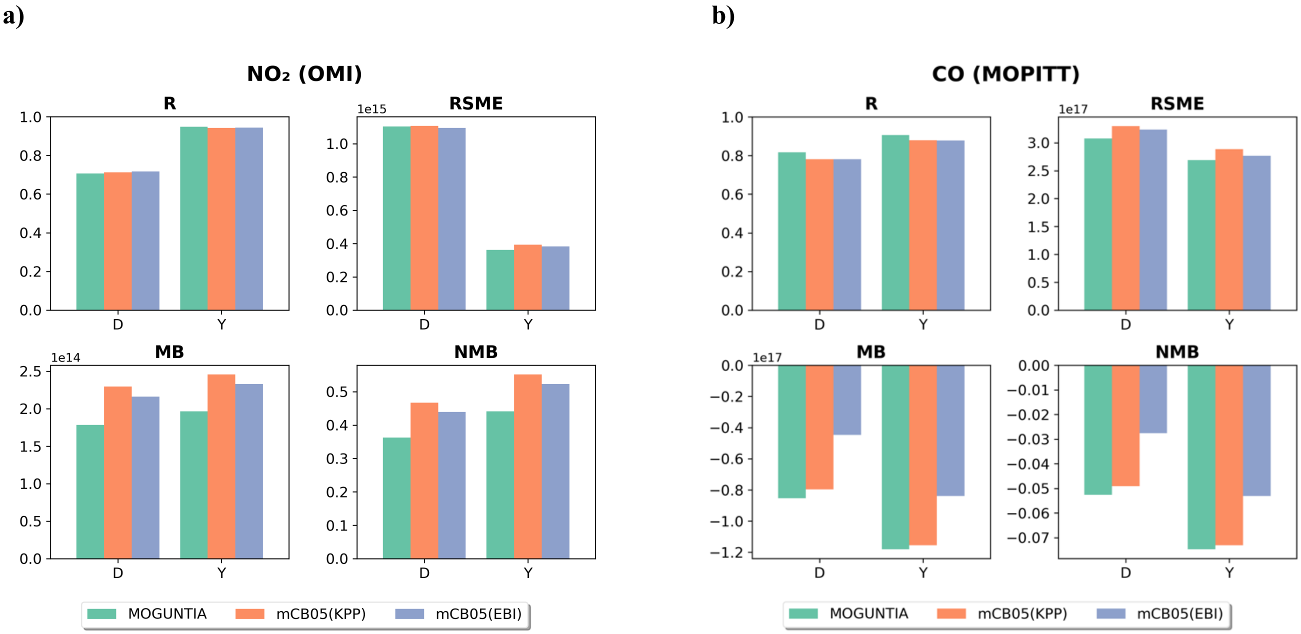
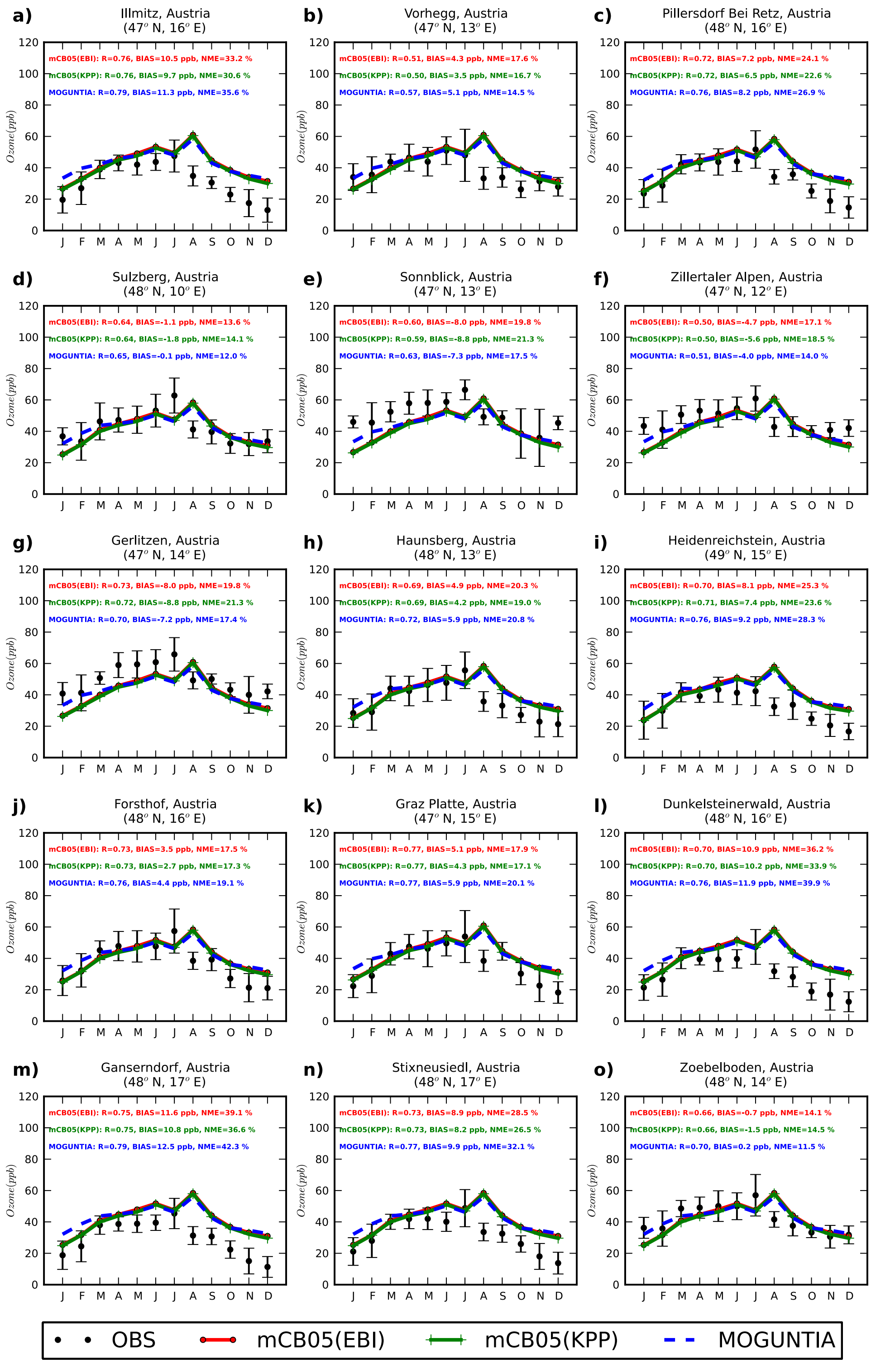
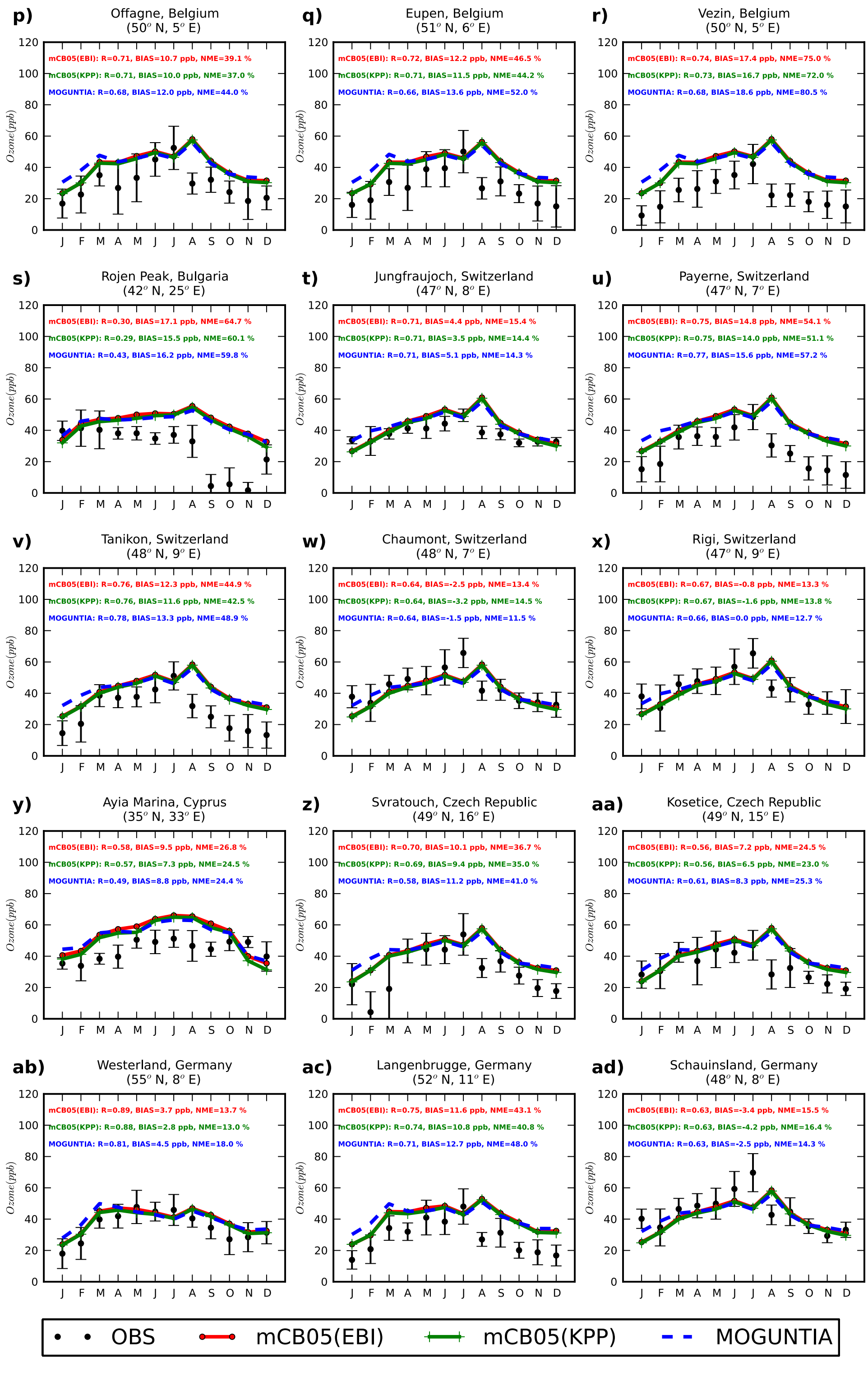
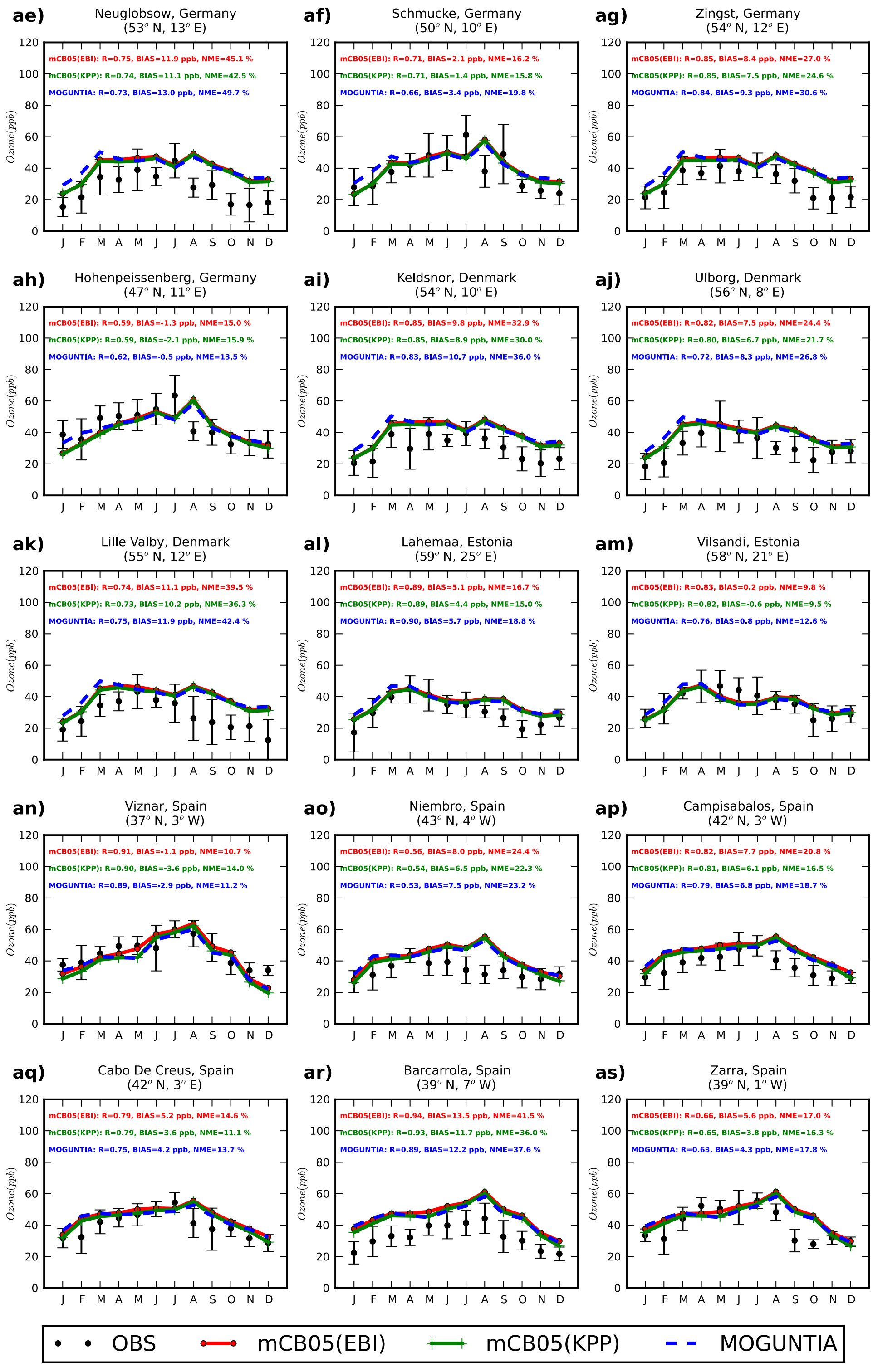


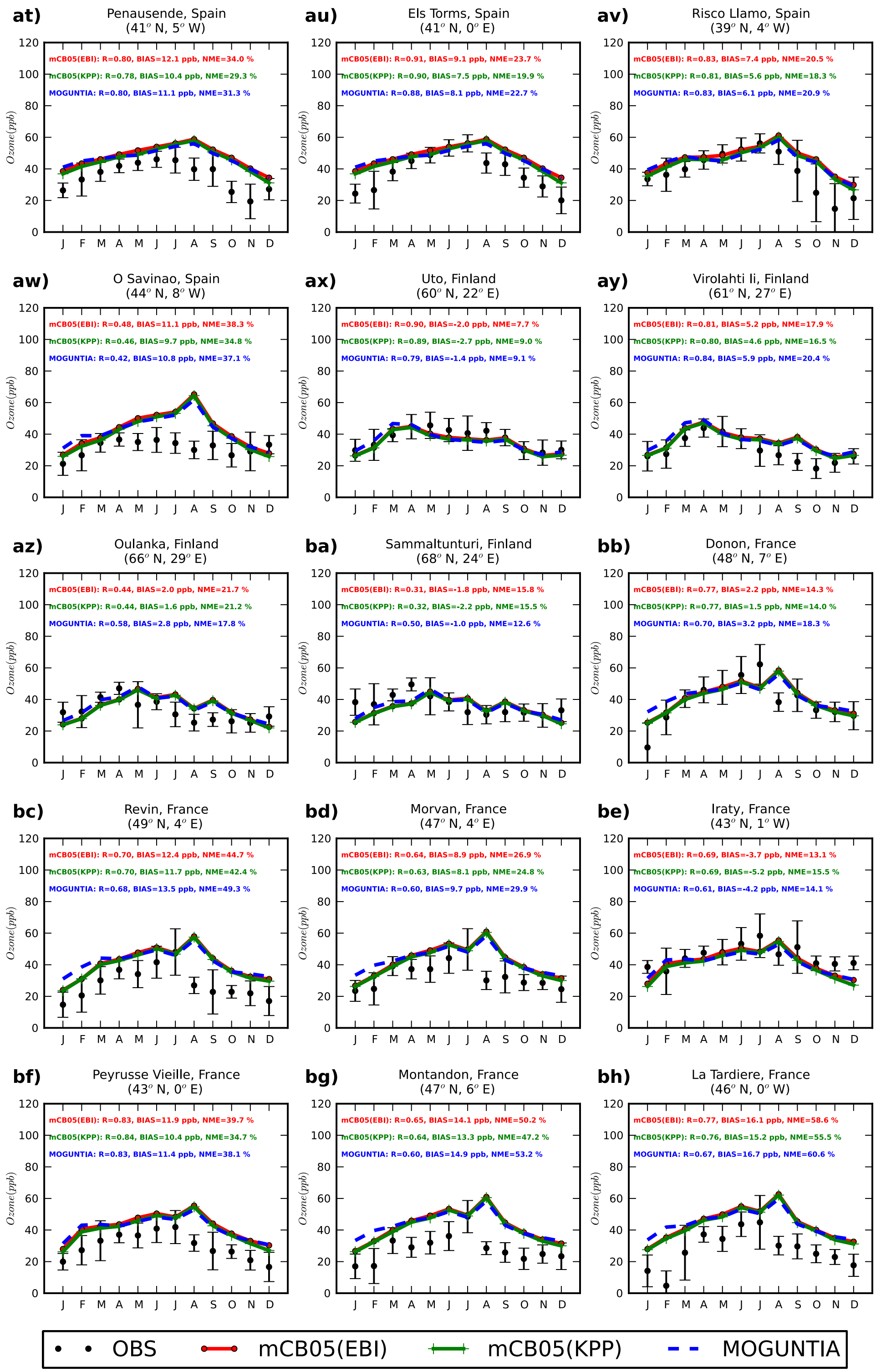
Figure S1: Comparison of simulated a) tropospheric NO_2 columns with OMI retrievals from the QA4ECV dataset and b) simulated total CO columns with MOPITT retrievals (vers. MOP02J_V008) for the year 2006. Green, orange, and blue bars show the comparison of OMI with the MOGUNTIA, mCB05(KPP), and mCB05(EBI) chemistry mechanisms, respectively: Pearson correlation coefficient (top left), root mean square error (top right), mean bias (measurement minus model, bottom left), and normalized mean bias (measurement minus model, bottom right) are given for both daily (D) and yearly (Y) averages per model grid cell.


a) Illmitz, Austria (47° N, 16° E)
mCB05(EBI): R=0.76, BIAS=10.5 ppb, NME=33.2 %
mCB05(KPP): R=0.76, BIAS=9.7 ppb, NME=30.6 %
MOGUNTIA: R=0.79, BIAS=11.3 ppb, NME=35.6 %
b) Vorhegg, Austria (47° N, 13° E)
mCB05(EBI): R=0.51, BIAS=4.3 ppb, NME=17.6 %
mCB05(KPP): R=0.50, BIAS=3.5 ppb, NME=16.7 %
MOGUNTIA: R=0.57, BIAS=5.1 ppb, NME=14.5 %
c) Pillersdorf Bei Retz, Austria (48° N, 16° E)
mCB05(EBI): R=0.72, BIAS=7.2 ppb, NME=24.1 %
mCB05(KPP): R=0.72, BIAS=6.5 ppb, NME=22.6 %
MOGUNTIA: R=0.76, BIAS=8.2 ppb, NME=26.9 %
d) Sulzberg, Austria (48° N, 10° E)
mCB05(EBI): R=0.64, BIAS=-1.1 ppb, NME=13.6 %
mCB05(KPP): R=0.64, BIAS=-1.8 ppb, NME=14.1 %
MOGUNTIA: R=0.65, BIAS=-0.1 ppb, NME=12.0 %
e) Sonnblick, Austria (47° N, 13° E)
mCB05(EBI): R=0.60, BIAS=-8.0 ppb, NME=19.8 %
mCB05(KPP): R=0.59, BIAS=-8.8 ppb, NME=21.3 %
MOGUNTIA: R=0.63, BIAS=-7.3 ppb, NME=17.5 %
f) Zillertaler Alpen, Austria (47° N, 12° E)
mCB05(EBI): R=0.50, BIAS=-4.7 ppb, NME=17.1 %
mCB05(KPP): R=0.50, BIAS=-5.6 ppb, NME=18.5 %
MOGUNTIA: R=0.51, BIAS=-4.0 ppb, NME=14.0 %
g) Gerlitzen, Austria (47° N, 14° E)
mCB05(EBI): R=0.73, BIAS=-8.0 ppb, NME=19.8 %
mCB05(KPP): R=0.72, BIAS=-8.8 ppb, NME=21.3 %
MOGUNTIA: R=0.70, BIAS=-7.2 ppb, NME=17.4 %
h) Haunsberg, Austria (48° N, 13° E)
mCB05(EBI): R=0.69, BIAS=4.9 ppb, NME=20.3 %
mCB05(KPP): R=0.69, BIAS=4.2 ppb, NME=19.0 %
MOGUNTIA: R=0.72, BIAS=5.9 ppb, NME=20.8 %
i) Heidenreichstein, Austria (49° N, 15° E)
mCB05(EBI): R=0.70, BIAS=8.1 ppb, NME=25.3 %
mCB05(KPP): R=0.71, BIAS=7.4 ppb, NME=23.6 %
MOGUNTIA: R=0.76, BIAS=9.2 ppb, NME=28.3 %
j) Forsthof, Austria (48° N, 16° E)
mCB05(EBI): R=0.73, BIAS=3.5 ppb, NME=17.5 %
mCB05(KPP): R=0.73, BIAS=2.7 ppb, NME=17.3 %
MOGUNTIA: R=0.76, BIAS=4.4 ppb, NME=19.1 %
k) Graz Platte, Austria (47° N, 15° E)
mCB05(EBI): R=0.77, BIAS=5.1 ppb, NME=17.9 %
mCB05(KPP): R=0.77, BIAS=4.3 ppb, NME=17.1 %
MOGUNTIA: R=0.77, BIAS=5.9 ppb, NME=20.1 %
l) Dunkelsteinerwald, Austria (48° N, 16° E)
mCB05(EBI): R=0.70, BIAS=10.9 ppb, NME=36.2 %
mCB05(KPP): R=0.70, BIAS=10.2 ppb, NME=33.9 %
MOGUNTIA: R=0.76, BIAS=11.9 ppb, NME=39.9 %
m) Ganserndorf, Austria (48° N, 17° E)
mCB05(EBI): R=0.75, BIAS=11.6 ppb, NME=39.1 %
mCB05(KPP): R=0.75, BIAS=10.8 ppb, NME=36.6 %
MOGUNTIA: R=0.79, BIAS=12.5 ppb, NME=42.3 %
n) Stixneusiedl, Austria (48° N, 17° E)
mCB05(EBI): R=0.73, BIAS=8.9 ppb, NME=28.5 %
mCB05(KPP): R=0.73, BIAS=8.2 ppb, NME=26.5 %
MOGUNTIA: R=0.77, BIAS=9.9 ppb, NME=32.1 %
o) Zoebelboden, Austria (48° N, 14° E)
mCB05(EBI): R=0.66, BIAS=-0.7 ppb, NME=14.1 %
mCB05(KPP): R=0.66, BIAS=-1.5 ppb, NME=14.5 %
MOGUNTIA: R=0.70, BIAS=0.2 ppb, NME=11.5 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

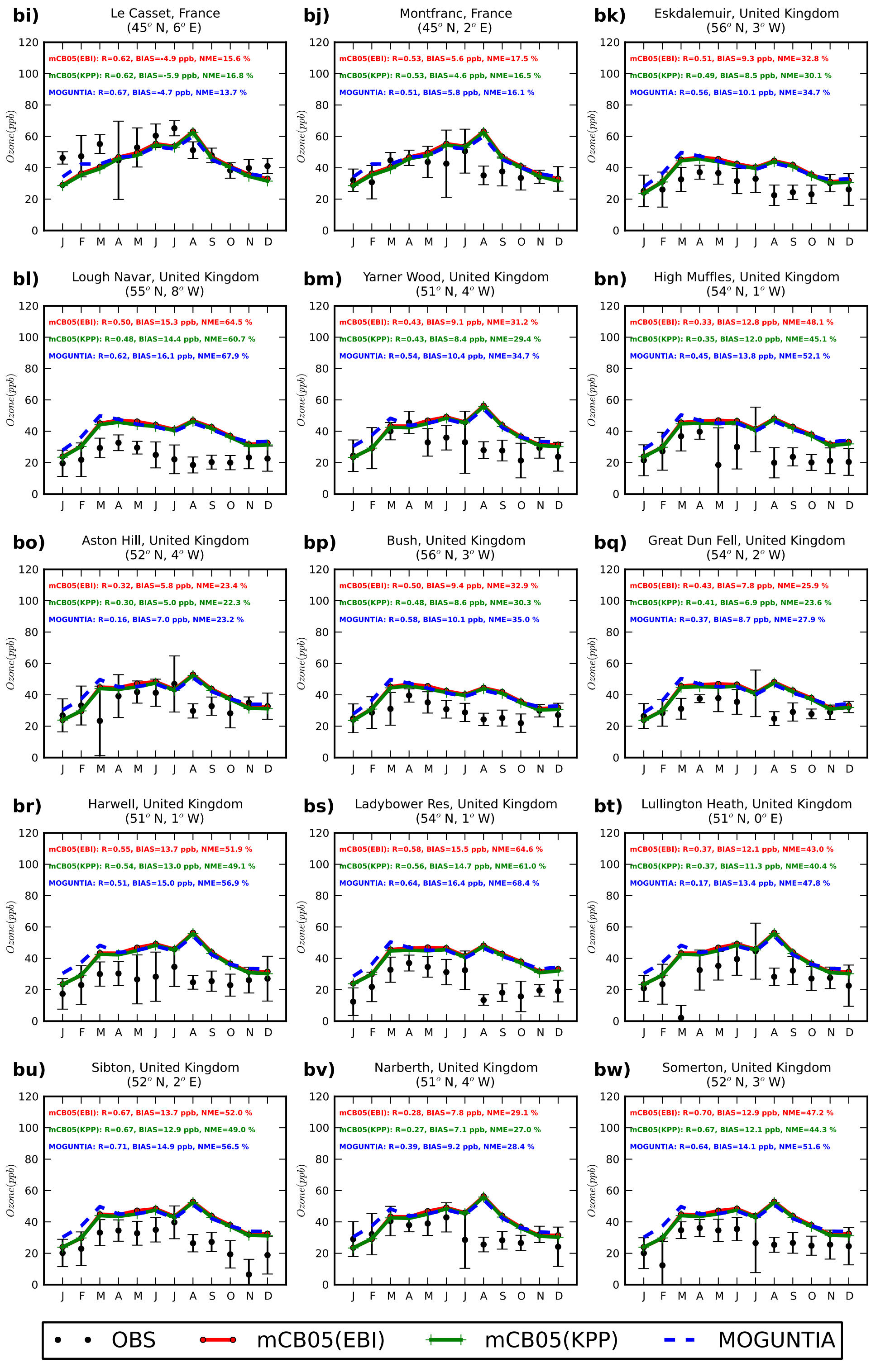

p) Offagne, Belgium (50° N, 5° E)
mCB05(EBI): R=0.71, BIAS=10.7 ppb, NME=39.1 %
mCB05(KPP): R=0.71, BIAS=10.0 ppb, NME=37.0 %
MOGUNTIA: R=0.68, BIAS=12.0 ppb, NME=44.0 %
q) Eupen, Belgium (51° N, 6° E)
mCB05(EBI): R=0.72, BIAS=12.2 ppb, NME=46.5 %
mCB05(KPP): R=0.71, BIAS=11.5 ppb, NME=44.2 %
MOGUNTIA: R=0.66, BIAS=13.6 ppb, NME=52.0 %
r) Vezin, Belgium (50° N, 5° E)
mCB05(EBI): R=0.74, BIAS=17.4 ppb, NME=75.0 %
mCB05(KPP): R=0.73, BIAS=16.7 ppb, NME=72.0 %
MOGUNTIA: R=0.68, BIAS=18.6 ppb, NME=80.5 %
s) Rojen Peak, Bulgaria (42° N, 25° E)
mCB05(EBI): R=0.30, BIAS=17.1 ppb, NME=64.7 %
mCB05(KPP): R=0.29, BIAS=15.5 ppb, NME=60.1 %
MOGUNTIA: R=0.43, BIAS=16.2 ppb, NME=59.8 %
t) Jungfraujoch, Switzerland (47° N, 8° E)
mCB05(EBI): R=0.71, BIAS=4.4 ppb, NME=15.4 %
mCB05(KPP): R=0.71, BIAS=3.5 ppb, NME=14.4 %
MOGUNTIA: R=0.71, BIAS=5.1 ppb, NME=14.3 %
u) Payerne, Switzerland (47° N, 7° E)
mCB05(EBI): R=0.75, BIAS=14.8 ppb, NME=54.1 %
mCB05(KPP): R=0.75, BIAS=14.0 ppb, NME=51.1 %
MOGUNTIA: R=0.77, BIAS=15.6 ppb, NME=57.2 %
v) Tanikon, Switzerland (48° N, 9° E)
mCB05(EBI): R=0.76, BIAS=12.3 ppb, NME=44.9 %
mCB05(KPP): R=0.76, BIAS=11.6 ppb, NME=42.5 %
MOGUNTIA: R=0.78, BIAS=13.3 ppb, NME=48.9 %
w) Chaumont, Switzerland (48° N, 7° E)
mCB05(EBI): R=0.64, BIAS=-2.5 ppb, NME=13.4 %
mCB05(KPP): R=0.64, BIAS=-3.2 ppb, NME=14.5 %
MOGUNTIA: R=0.64, BIAS=-1.5 ppb, NME=11.5 %
x) Rigi, Switzerland (47° N, 9° E)
mCB05(EBI): R=0.67, BIAS=-0.8 ppb, NME=13.3 %
mCB05(KPP): R=0.67, BIAS=-1.6 ppb, NME=13.8 %
MOGUNTIA: R=0.66, BIAS=0.0 ppb, NME=12.7 %
y) Ayia Marina, Cyprus (35° N, 33° E)
mCB05(EBI): R=0.58, BIAS=9.5 ppb, NME=26.8 %
mCB05(KPP): R=0.57, BIAS=7.3 ppb, NME=24.5 %
MOGUNTIA: R=0.49, BIAS=8.8 ppb, NME=24.4 %
z) Svratouch, Czech Republic (49° N, 16° E)
mCB05(EBI): R=0.70, BIAS=10.1 ppb, NME=36.7 %
mCB05(KPP): R=0.69, BIAS=9.4 ppb, NME=35.0 %
MOGUNTIA: R=0.58, BIAS=11.2 ppb, NME=41.0 %
aa) Kosetice, Czech Republic (49° N, 15° E)
mCB05(EBI): R=0.56, BIAS=7.2 ppb, NME=24.5 %
mCB05(KPP): R=0.56, BIAS=6.5 ppb, NME=23.0 %
MOGUNTIA: R=0.61, BIAS=8.3 ppb, NME=25.3 %
ab) Westerland, Germany (55° N, 8° E)
mCB05(EBI): R=0.89, BIAS=3.7 ppb, NME=13.7 %
mCB05(KPP): R=0.88, BIAS=2.8 ppb, NME=13.0 %
MOGUNTIA: R=0.81, BIAS=4.5 ppb, NME=18.0 %
ac) Langenbrugge, Germany (52° N, 11° E)
mCB05(EBI): R=0.75, BIAS=11.6 ppb, NME=43.1 %
mCB05(KPP): R=0.74, BIAS=10.8 ppb, NME=40.8 %
MOGUNTIA: R=0.71, BIAS=12.7 ppb, NME=48.0 %
ad) Schauinsland, Germany (48° N, 8° E)
mCB05(EBI): R=0.63, BIAS=-3.4 ppb, NME=15.5 %
mCB05(KPP): R=0.63, BIAS=-4.2 ppb, NME=16.4 %
MOGUNTIA: R=0.63, BIAS=-2.5 ppb, NME=14.3 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

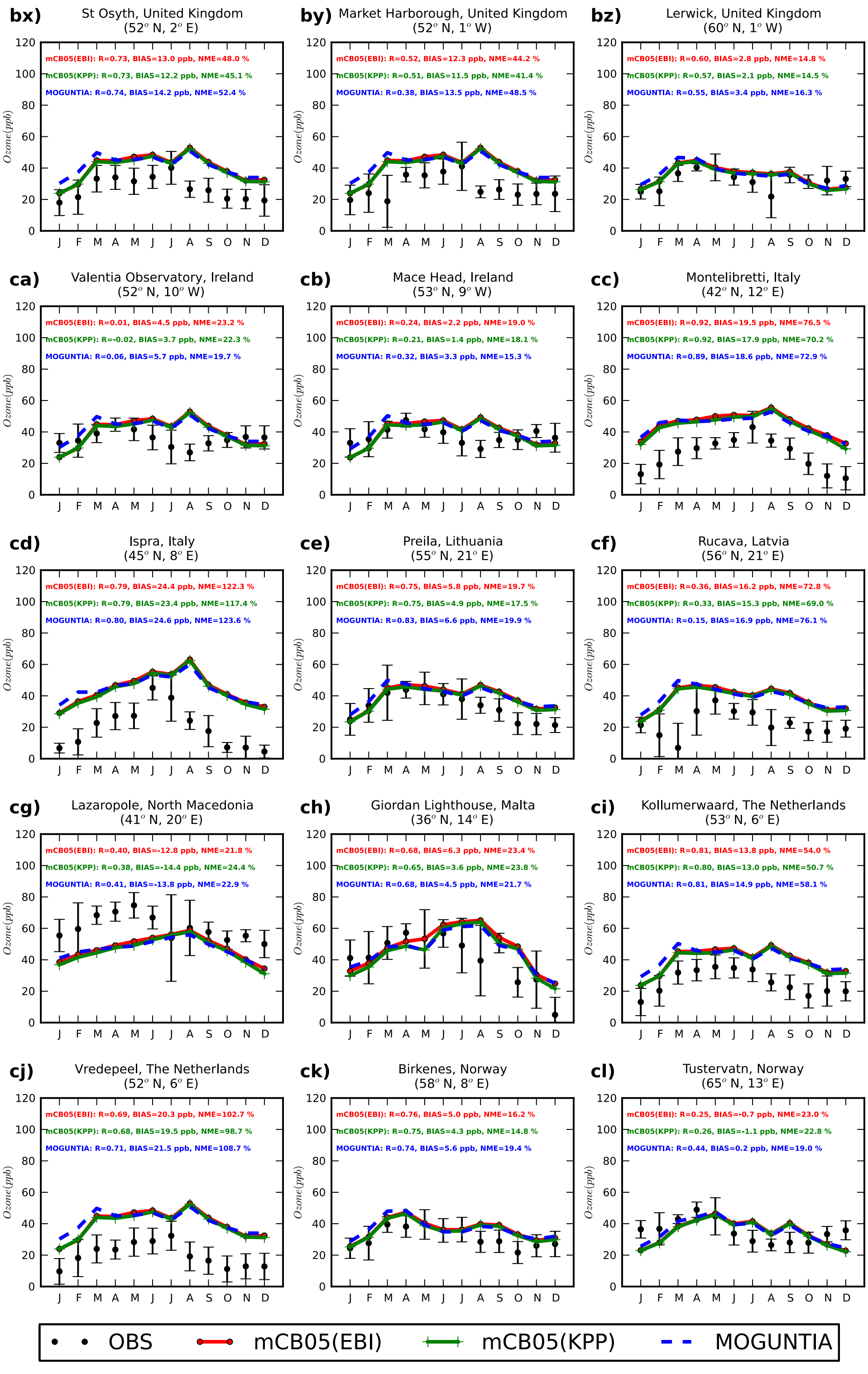


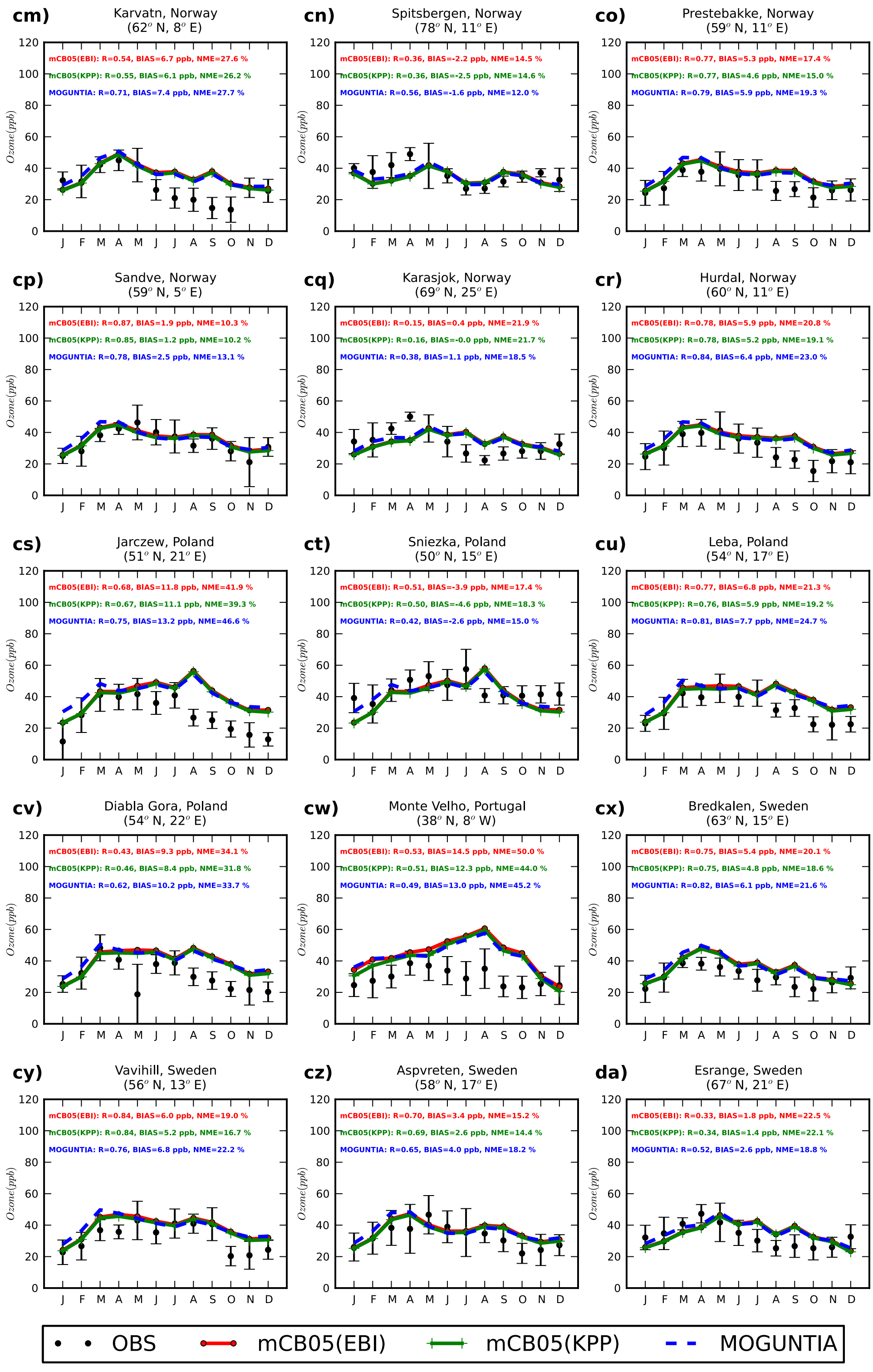
ae) Neuglobsow, Germany (53° N, 13° E)
mCB05(EBI): R=0.75, BIAS=11.9 ppb, NME=45.1 %
mCB05(KPP): R=0.74, BIAS=11.1 ppb, NME=42.5 %
MOGUNTIA: R=0.73, BIAS=13.0 ppb, NME=49.7 %
af) Schmucke, Germany (50° N, 10° E)
mCB05(EBI): R=0.71, BIAS=2.1 ppb, NME=16.2 %
mCB05(KPP): R=0.71, BIAS=1.4 ppb, NME=15.8 %
MOGUNTIA: R=0.66, BIAS=3.4 ppb, NME=19.8 %
ag) Zingst, Germany (54° N, 12° E)
mCB05(EBI): R=0.85, BIAS=8.4 ppb, NME=27.0 %
mCB05(KPP): R=0.85, BIAS=7.5 ppb, NME=24.6 %
MOGUNTIA: R=0.84, BIAS=9.3 ppb, NME=30.6 %
ah) Hohenpeissenberg, Germany (47° N, 11° E)
mCB05(EBI): R=0.59, BIAS=-1.3 ppb, NME=15.0 %
mCB05(KPP): R=0.59, BIAS=-2.1 ppb, NME=15.9 %
MOGUNTIA: R=0.62, BIAS=-0.5 ppb, NME=13.5 %
ai) Keldsnor, Denmark (54° N, 10° E)
mCB05(EBI): R=0.85, BIAS=9.8 ppb, NME=32.9 %
mCB05(KPP): R=0.85, BIAS=8.9 ppb, NME=30.0 %
MOGUNTIA: R=0.83, BIAS=10.7 ppb, NME=36.0 %
aj) Ulborg, Denmark (56° N, 8° E)
mCB05(EBI): R=0.82, BIAS=7.5 ppb, NME=24.4 %
mCB05(KPP): R=0.80, BIAS=6.7 ppb, NME=21.7 %
MOGUNTIA: R=0.72, BIAS=8.3 ppb, NME=26.8 %
ak) Lille Valby, Denmark (55° N, 12° E)
mCB05(EBI): R=0.74, BIAS=11.1 ppb, NME=39.5 %
mCB05(KPP): R=0.73, BIAS=10.2 ppb, NME=36.3 %
MOGUNTIA: R=0.75, BIAS=11.9 ppb, NME=42.4 %
al) Lahemaa, Estonia (59° N, 25° E)
mCB05(EBI): R=0.89, BIAS=5.1 ppb, NME=16.7 %
mCB05(KPP): R=0.89, BIAS=4.4 ppb, NME=15.0 %
MOGUNTIA: R=0.90, BIAS=5.7 ppb, NME=18.8 %
am) Vilsandi, Estonia (58° N, 21° E)
mCB05(EBI): R=0.83, BIAS=0.2 ppb, NME=9.8 %
mCB05(KPP): R=0.82, BIAS=-0.6 ppb, NME=9.5 %
MOGUNTIA: R=0.76, BIAS=0.8 ppb, NME=12.6 %
an) Viznar, Spain (37° N, 3° W)
mCB05(EBI): R=0.91, BIAS=-1.1 ppb, NME=10.7 %
mCB05(KPP): R=0.90, BIAS=-3.6 ppb, NME=14.0 %
MOGUNTIA: R=0.89, BIAS=-2.9 ppb, NME=11.2 %
ao) Niembro, Spain (43° N, 4° W)
mCB05(EBI): R=0.56, BIAS=8.0 ppb, NME=24.4 %
mCB05(KPP): R=0.54, BIAS=6.5 ppb, NME=22.3 %
MOGUNTIA: R=0.53, BIAS=7.5 ppb, NME=23.2 %
ap) Campisabalos, Spain (42° N, 3° W)
mCB05(EBI): R=0.82, BIAS=7.7 ppb, NME=20.8 %
mCB05(KPP): R=0.81, BIAS=6.1 ppb, NME=16.5 %
MOGUNTIA: R=0.79, BIAS=6.8 ppb, NME=18.7 %
aq) Cabo De Creus, Spain (42° N, 3° E)
mCB05(EBI): R=0.79, BIAS=5.2 ppb, NME=14.6 %
mCB05(KPP): R=0.79, BIAS=3.6 ppb, NME=11.1 %
MOGUNTIA: R=0.75, BIAS=4.2 ppb, NME=13.7 %
ar) Barcarrola, Spain (39° N, 7° W)
mCB05(EBI): R=0.94, BIAS=13.5 ppb, NME=41.5 %
mCB05(KPP): R=0.93, BIAS=11.7 ppb, NME=36.0 %
MOGUNTIA: R=0.89, BIAS=12.2 ppb, NME=37.6 %
as) Zarra, Spain (39° N, 1° W)
mCB05(EBI): R=0.66, BIAS=5.6 ppb, NME=17.0 %
mCB05(KPP): R=0.65, BIAS=3.8 ppb, NME=16.3 %
MOGUNTIA: R=0.63, BIAS=4.3 ppb, NME=17.8 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA



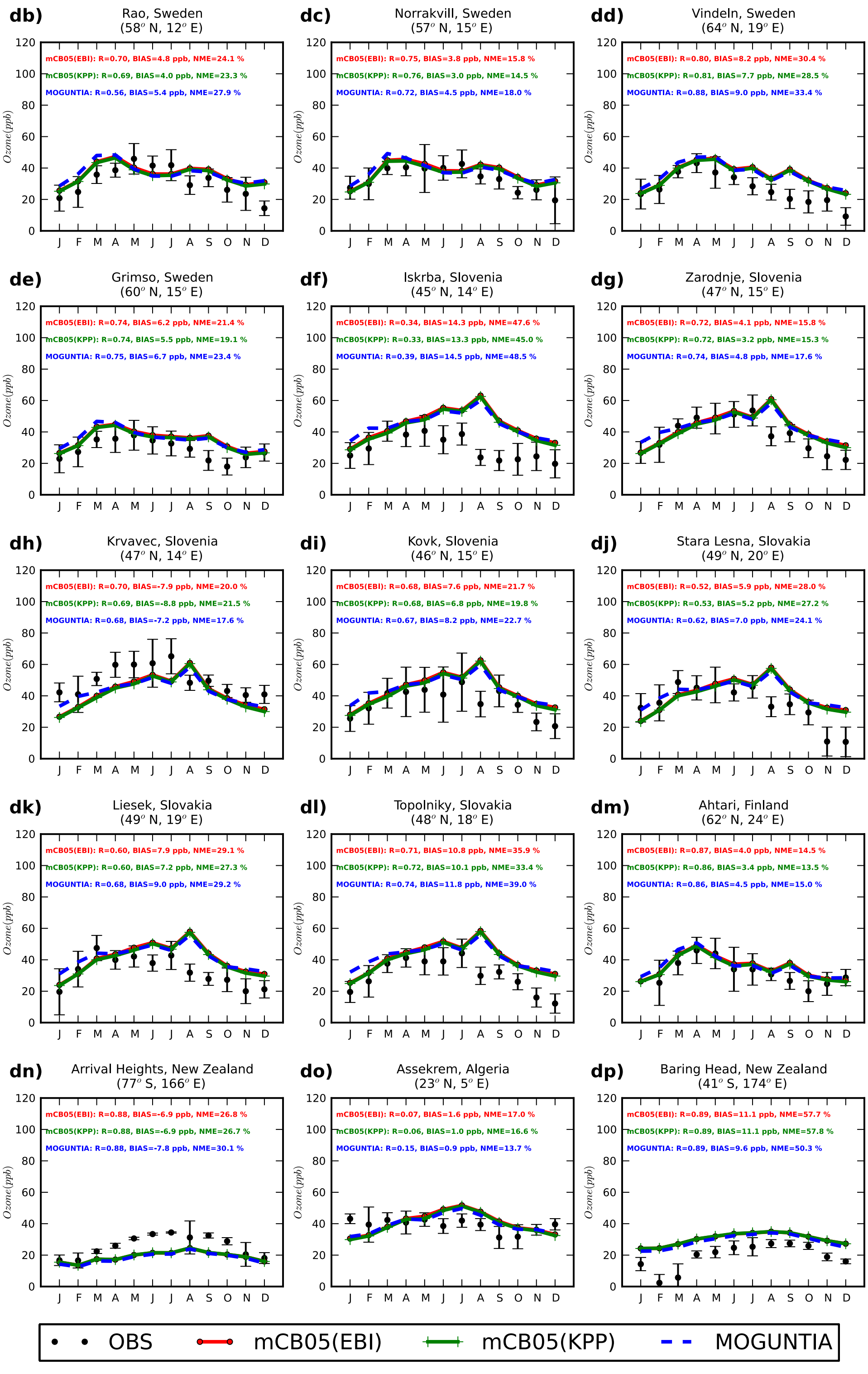
at) Penausende, Spain (41° N, 5° W)
mCB05(EBI): R=0.80, BIAS=12.1 ppb, NME=34.0 %
mCB05(KPP): R=0.78, BIAS=10.4 ppb, NME=29.3 %
MOGUNTIA: R=0.80, BIAS=11.1 ppb, NME=31.3 %
au) Els Torms, Spain (41° N, 0° E)
mCB05(EBI): R=0.91, BIAS=9.1 ppb, NME=23.7 %
mCB05(KPP): R=0.90, BIAS=7.5 ppb, NME=19.9 %
MOGUNTIA: R=0.88, BIAS=8.1 ppb, NME=22.7 %
av) Risco Llamo, Spain (39° N, 4° W)
mCB05(EBI): R=0.83, BIAS=7.4 ppb, NME=20.5 %
mCB05(KPP): R=0.81, BIAS=5.6 ppb, NME=18.3 %
MOGUNTIA: R=0.83, BIAS=6.1 ppb, NME=20.9 %
aw) O Savinao, Spain (44° N, 8° W)
mCB05(EBI): R=0.48, BIAS=11.1 ppb, NME=38.3 %
mCB05(KPP): R=0.46, BIAS=9.7 ppb, NME=34.8 %
MOGUNTIA: R=0.42, BIAS=10.8 ppb, NME=37.1 %
ax) Uto, Finland (60° N, 22° E)
mCB05(EBI): R=0.90, BIAS=-2.0 ppb, NME=7.7 %
mCB05(KPP): R=0.89, BIAS=-2.7 ppb, NME=9.0 %
MOGUNTIA: R=0.79, BIAS=-1.4 ppb, NME=9.1 %
ay) Virolahti Ii, Finland (61° N, 27° E)
mCB05(EBI): R=0.81, BIAS=5.2 ppb, NME=17.9 %
mCB05(KPP): R=0.80, BIAS=4.6 ppb, NME=16.5 %
MOGUNTIA: R=0.84, BIAS=5.9 ppb, NME=20.4 %
az) Oulanka, Finland (66° N, 29° E)
mCB05(EBI): R=0.44, BIAS=2.0 ppb, NME=21.7 %
mCB05(KPP): R=0.44, BIAS=1.6 ppb, NME=21.2 %
MOGUNTIA: R=0.58, BIAS=2.8 ppb, NME=17.8 %
ba) Sammaltunturi, Finland (68° N, 24° E)
mCB05(EBI): R=0.31, BIAS=-1.8 ppb, NME=15.8 %
mCB05(KPP): R=0.32, BIAS=-2.2 ppb, NME=15.5 %
MOGUNTIA: R=0.50, BIAS=-1.0 ppb, NME=12.6 %
bb) Donon, France (48° N, 7° E)
mCB05(EBI): R=0.77, BIAS=2.2 ppb, NME=14.3 %
mCB05(KPP): R=0.77, BIAS=1.5 ppb, NME=14.0 %
MOGUNTIA: R=0.70, BIAS=3.2 ppb, NME=18.3 %
bc) Revin, France (49° N, 4° E)
mCB05(EBI): R=0.70, BIAS=12.4 ppb, NME=44.7 %
mCB05(KPP): R=0.70, BIAS=11.7 ppb, NME=42.4 %
MOGUNTIA: R=0.68, BIAS=13.5 ppb, NME=49.3 %
bd) Morvan, France (47° N, 4° E)
mCB05(EBI): R=0.64, BIAS=8.9 ppb, NME=26.9 %
mCB05(KPP): R=0.63, BIAS=8.1 ppb, NME=24.8 %
MOGUNTIA: R=0.60, BIAS=9.7 ppb, NME=29.9 %
be) Iraty, France (43° N, 1° W)
mCB05(EBI): R=0.69, BIAS=-3.7 ppb, NME=13.1 %
mCB05(KPP): R=0.69, BIAS=-5.2 ppb, NME=15.5 %
MOGUNTIA: R=0.61, BIAS=-4.2 ppb, NME=14.1 %
bf) Peyrusse Vieille, France (43° N, 0° E)
mCB05(EBI): R=0.83, BIAS=11.9 ppb, NME=39.7 %
mCB05(KPP): R=0.84, BIAS=10.4 ppb, NME=34.7 %
MOGUNTIA: R=0.83, BIAS=11.4 ppb, NME=38.1 %
bg) Montandon, France (47° N, 6° E)
mCB05(EBI): R=0.65, BIAS=14.1 ppb, NME=50.2 %
mCB05(KPP): R=0.64, BIAS=13.3 ppb, NME=47.2 %
MOGUNTIA: R=0.60, BIAS=14.9 ppb, NME=53.2 %
bh) La Tardiere, France (46° N, 0° W)
mCB05(EBI): R=0.77, BIAS=16.1 ppb, NME=58.6 %
mCB05(KPP): R=0.76, BIAS=15.2 ppb, NME=55.5 %
MOGUNTIA: R=0.67, BIAS=16.7 ppb, NME=60.6 %
Ozone(ppb)
0 20 40 60 80 100 120
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

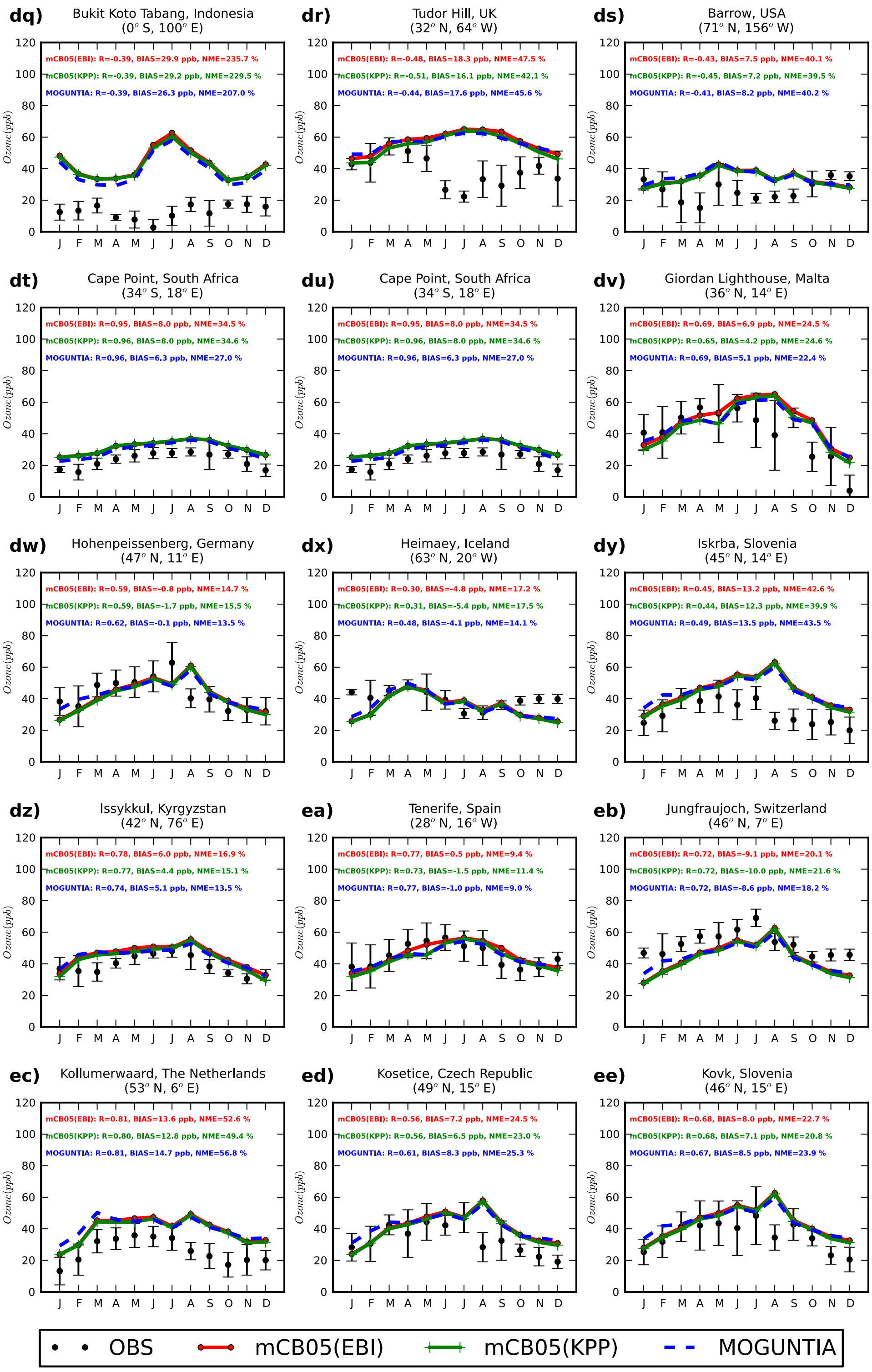

bi) Le Casset, France (45° N, 6° E)
mCB05(EBI): R=0.62, BIAS=-4.9 ppb, NME=15.6 %
mCB05(KPP): R=0.62, BIAS=-5.9 ppb, NME=16.8 %
MOGUNTIA: R=0.67, BIAS=-4.7 ppb, NME=13.7 %
bj) Montfranc, France (45° N, 2° E)
mCB05(EBI): R=0.53, BIAS=5.6 ppb, NME=17.5 %
mCB05(KPP): R=0.53, BIAS=4.6 ppb, NME=16.5 %
MOGUNTIA: R=0.51, BIAS=5.8 ppb, NME=16.1 %
bk) Eskdalemuir, United Kingdom (56° N, 3° W)
mCB05(EBI): R=0.51, BIAS=9.3 ppb, NME=32.8 %
mCB05(KPP): R=0.49, BIAS=8.5 ppb, NME=30.1 %
MOGUNTIA: R=0.56, BIAS=10.1 ppb, NME=34.7 %
bl) Lough Navar, United Kingdom (55° N, 8° W)
mCB05(EBI): R=0.50, BIAS=15.3 ppb, NME=64.5 %
mCB05(KPP): R=0.48, BIAS=14.4 ppb, NME=60.7 %
MOGUNTIA: R=0.62, BIAS=16.1 ppb, NME=67.9 %
bm) Yarner Wood, United Kingdom (51° N, 4° W)
mCB05(EBI): R=0.43, BIAS=9.1 ppb, NME=31.2 %
mCB05(KPP): R=0.43, BIAS=8.4 ppb, NME=29.4 %
MOGUNTIA: R=0.54, BIAS=10.4 ppb, NME=34.7 %
bn) High Muffles, United Kingdom (54° N, 1° W)
mCB05(EBI): R=0.33, BIAS=12.8 ppb, NME=48.1 %
mCB05(KPP): R=0.35, BIAS=12.0 ppb, NME=45.1 %
MOGUNTIA: R=0.45, BIAS=13.8 ppb, NME=52.1 %
bo) Aston Hill, United Kingdom (52° N, 4° W)
mCB05(EBI): R=0.32, BIAS=5.8 ppb, NME=23.4 %
mCB05(KPP): R=0.30, BIAS=5.0 ppb, NME=22.3 %
MOGUNTIA: R=0.16, BIAS=7.0 ppb, NME=23.2 %
bp) Bush, United Kingdom (56° N, 3° W)
mCB05(EBI): R=0.50, BIAS=9.4 ppb, NME=32.9 %
mCB05(KPP): R=0.48, BIAS=8.6 ppb, NME=30.3 %
MOGUNTIA: R=0.58, BIAS=10.1 ppb, NME=35.0 %
bq) Great Dun Fell, United Kingdom (54° N, 2° W)
mCB05(EBI): R=0.43, BIAS=7.8 ppb, NME=25.9 %
mCB05(KPP): R=0.41, BIAS=6.9 ppb, NME=23.6 %
MOGUNTIA: R=0.37, BIAS=8.7 ppb, NME=27.9 %
br) Harwell, United Kingdom (51° N, 1° W)
mCB05(EBI): R=0.55, BIAS=13.7 ppb, NME=51.9 %
mCB05(KPP): R=0.54, BIAS=13.0 ppb, NME=49.1 %
MOGUNTIA: R=0.51, BIAS=15.0 ppb, NME=56.9 %
bs) Ladybower Res, United Kingdom (54° N, 1° W)
mCB05(EBI): R=0.58, BIAS=15.5 ppb, NME=64.6 %
mCB05(KPP): R=0.56, BIAS=14.7 ppb, NME=61.0 %
MOGUNTIA: R=0.64, BIAS=16.4 ppb, NME=68.4 %
bt) Lullington Heath, United Kingdom (51° N, 0° E)
mCB05(EBI): R=0.37, BIAS=12.1 ppb, NME=43.0 %
mCB05(KPP): R=0.37, BIAS=11.3 ppb, NME=40.4 %
MOGUNTIA: R=0.17, BIAS=13.4 ppb, NME=47.8 %
bu) Sibton, United Kingdom (52° N, 2° E)
mCB05(EBI): R=0.67, BIAS=13.7 ppb, NME=52.0 %
mCB05(KPP): R=0.67, BIAS=12.9 ppb, NME=49.0 %
MOGUNTIA: R=0.71, BIAS=14.9 ppb, NME=56.5 %
bv) Narberth, United Kingdom (51° N, 4° W)
mCB05(EBI): R=0.28, BIAS=7.8 ppb, NME=29.1 %
mCB05(KPP): R=0.27, BIAS=7.1 ppb, NME=27.0 %
MOGUNTIA: R=0.39, BIAS=9.2 ppb, NME=28.4 %
bw) Somerton, United Kingdom (52° N, 3° W)
mCB05(EBI): R=0.70, BIAS=12.9 ppb, NME=47.2 %
mCB05(KPP): R=0.67, BIAS=12.1 ppb, NME=44.3 %
MOGUNTIA: R=0.64, BIAS=14.1 ppb, NME=51.6 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

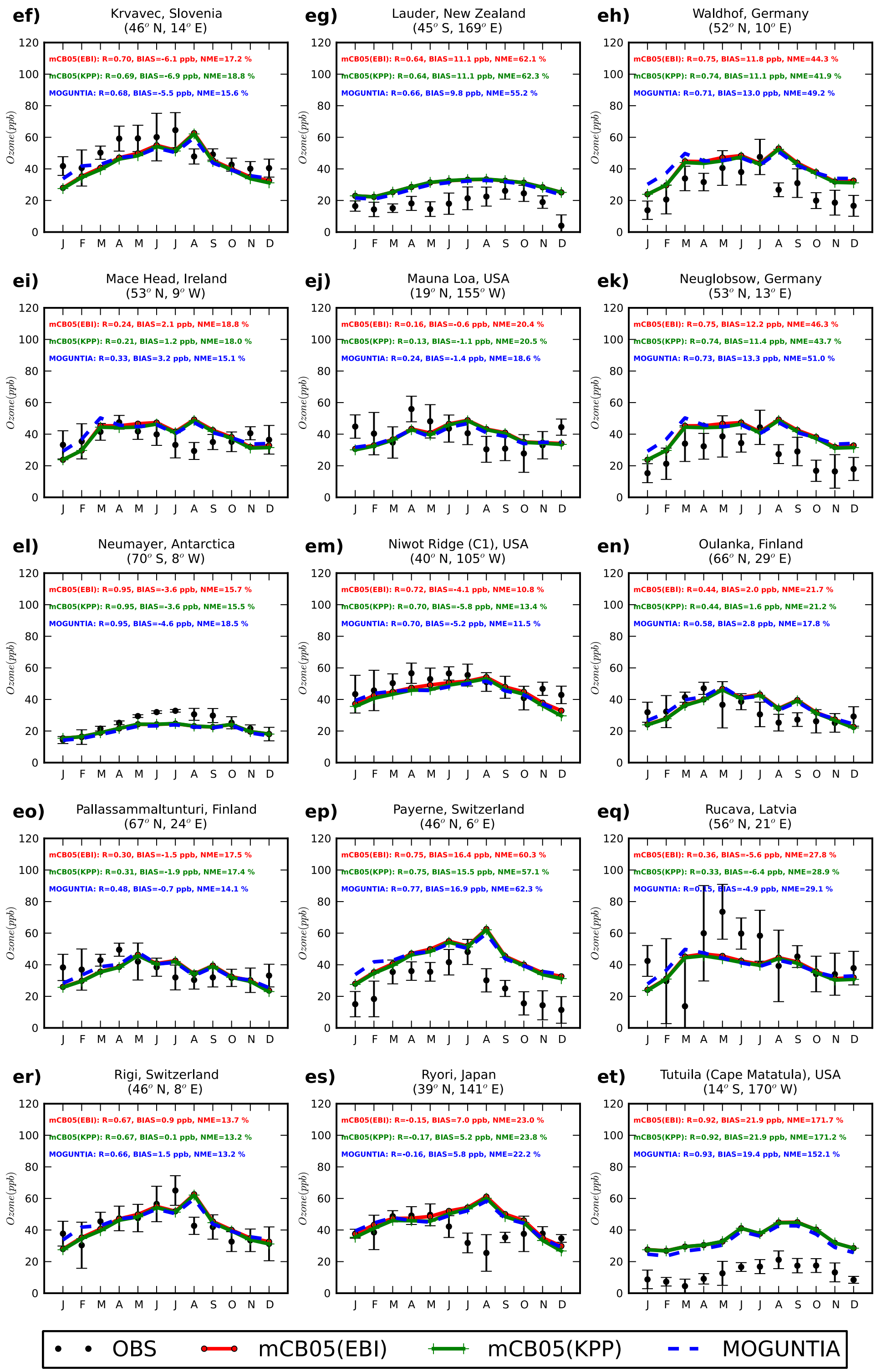

bx) St Osyth, United Kingdom (52° N, 2° E)
mCB05(EBI): R=0.73, BIAS=13.0 ppb, NME=48.0 %
mCB05(KPP): R=0.73, BIAS=12.2 ppb, NME=45.1 %
MOGUNTIA: R=0.74, BIAS=14.2 ppb, NME=52.4 %
by) Market Harborough, United Kingdom (52° N, 1° W)
mCB05(EBI): R=0.52, BIAS=12.3 ppb, NME=44.2 %
mCB05(KPP): R=0.51, BIAS=11.5 ppb, NME=41.4 %
MOGUNTIA: R=0.38, BIAS=13.5 ppb, NME=48.5 %
bz) Lerwick, United Kingdom (60° N, 1° W)
mCB05(EBI): R=0.60, BIAS=2.8 ppb, NME=14.8 %
mCB05(KPP): R=0.57, BIAS=2.1 ppb, NME=14.5 %
MOGUNTIA: R=0.55, BIAS=3.4 ppb, NME=16.3 %
ca) Valentia Observatory, Ireland (52° N, 10° W)
mCB05(EBI): R=0.01, BIAS=4.5 ppb, NME=23.2 %
mCB05(KPP): R=-0.02, BIAS=3.7 ppb, NME=22.3 %
MOGUNTIA: R=0.06, BIAS=5.7 ppb, NME=19.7 %
cb) Mace Head, Ireland (53° N, 9° W)
mCB05(EBI): R=0.24, BIAS=2.2 ppb, NME=19.0 %
mCB05(KPP): R=0.21, BIAS=1.4 ppb, NME=18.1 %
MOGUNTIA: R=0.32, BIAS=3.3 ppb, NME=15.3 %
cc) Montelibretti, Italy (42° N, 12° E)
mCB05(EBI): R=0.92, BIAS=19.5 ppb, NME=76.5 %
mCB05(KPP): R=0.92, BIAS=17.9 ppb, NME=70.2 %
MOGUNTIA: R=0.89, BIAS=18.6 ppb, NME=72.9 %
cd) Ispra, Italy (45° N, 8° E)
mCB05(EBI): R=0.79, BIAS=24.4 ppb, NME=122.3 %
mCB05(KPP): R=0.79, BIAS=23.4 ppb, NME=117.4 %
MOGUNTIA: R=0.80, BIAS=24.6 ppb, NME=123.6 %
ce) Preila, Lithuania (55° N, 21° E)
mCB05(EBI): R=0.75, BIAS=5.8 ppb, NME=19.7 %
mCB05(KPP): R=0.75, BIAS=4.9 ppb, NME=17.5 %
MOGUNTIA: R=0.83, BIAS=6.6 ppb, NME=19.9 %
cf) Rucava, Latvia (56° N, 21° E)
mCB05(EBI): R=0.36, BIAS=16.2 ppb, NME=72.8 %
mCB05(KPP): R=0.33, BIAS=15.3 ppb, NME=69.0 %
MOGUNTIA: R=0.15, BIAS=16.9 ppb, NME=76.1 %
cg) Lazaropole, North Macedonia (41° N, 20° E)
mCB05(EBI): R=0.40, BIAS=-12.8 ppb, NME=21.8 %
mCB05(KPP): R=0.38, BIAS=-14.4 ppb, NME=24.4 %
MOGUNTIA: R=0.41, BIAS=-13.8 ppb, NME=22.9 %
ch) Giordan Lighthouse, Malta (36° N, 14° E)
mCB05(EBI): R=0.68, BIAS=6.3 ppb, NME=23.4 %
mCB05(KPP): R=0.65, BIAS=3.6 ppb, NME=23.8 %
MOGUNTIA: R=0.68, BIAS=4.5 ppb, NME=21.7 %
ci) Kollumerwaard, The Netherlands (53° N, 6° E)
mCB05(EBI): R=0.81, BIAS=13.8 ppb, NME=54.0 %
mCB05(KPP): R=0.80, BIAS=13.0 ppb, NME=50.7 %
MOGUNTIA: R=0.81, BIAS=14.9 ppb, NME=58.1 %
cj) Vredepeel, The Netherlands (52° N, 6° E)
mCB05(EBI): R=0.69, BIAS=20.3 ppb, NME=102.7 %
mCB05(KPP): R=0.68, BIAS=19.5 ppb, NME=98.7 %
MOGUNTIA: R=0.71, BIAS=21.5 ppb, NME=108.7 %
ck) Birkenes, Norway (58° N, 8° E)
mCB05(EBI): R=0.76, BIAS=5.0 ppb, NME=16.2 %
mCB05(KPP): R=0.75, BIAS=4.3 ppb, NME=14.8 %
MOGUNTIA: R=0.74, BIAS=5.6 ppb, NME=19.4 %
cl) Tustervatn, Norway (65° N, 13° E)
mCB05(EBI): R=0.25, BIAS=-0.7 ppb, NME=23.0 %
mCB05(KPP): R=0.26, BIAS=-1.1 ppb, NME=22.8 %
MOGUNTIA: R=0.44, BIAS=0.2 ppb, NME=19.0 %
Ozone(ppb)
0 20 40 60 80 100 120
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA



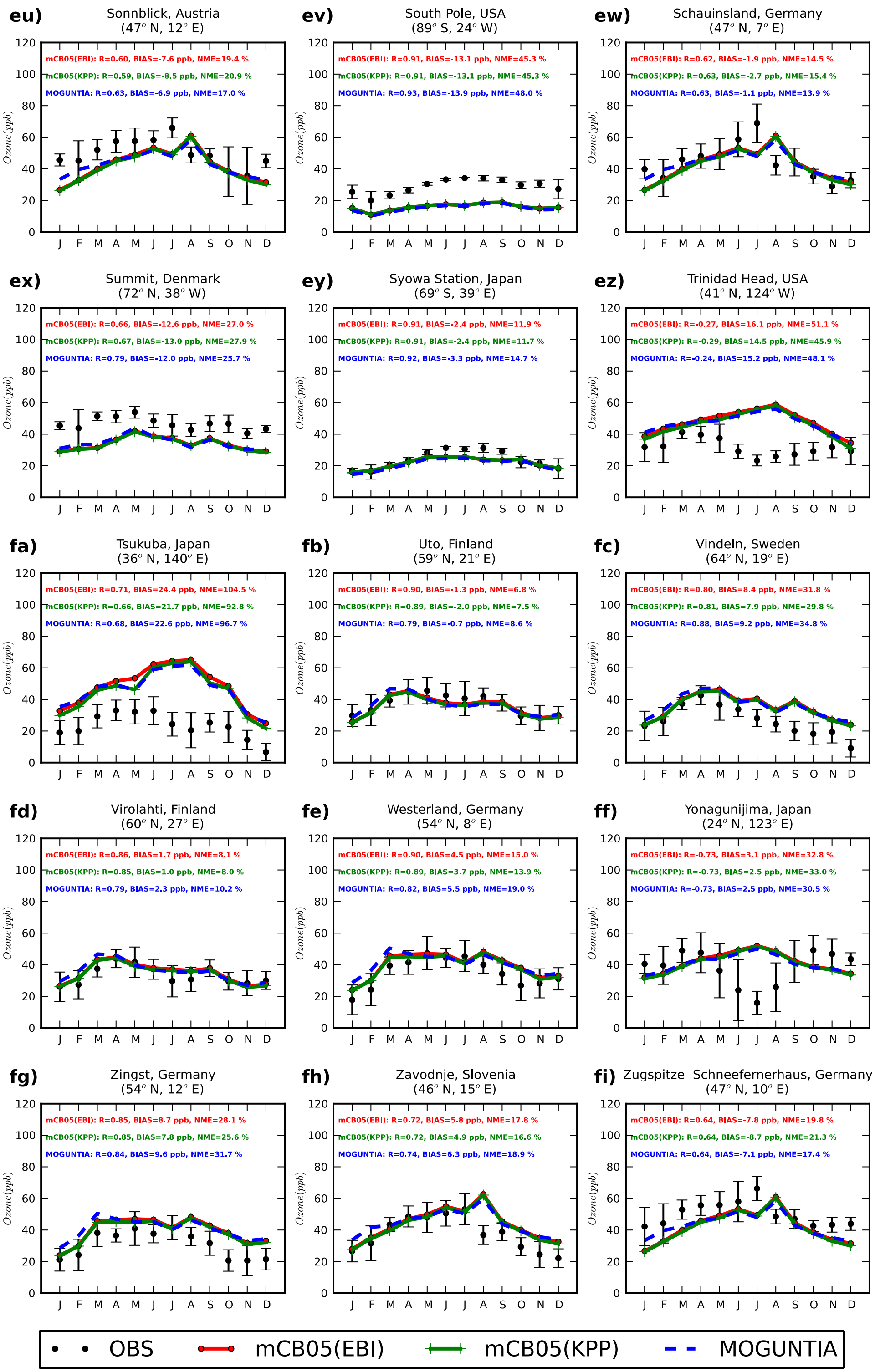
cm)
Karvatn, Norway
(62° N, 8° E)
mCB05(EBI): R=0.54, BIAS=6.7 ppb, NME=27.6 %
mCB05(KPP): R=0.55, BIAS=6.1 ppb, NME=26.2 %
MOGUNTIA: R=0.71, BIAS=7.4 ppb, NME=27.7 %
cn)
Spitsbergen, Norway
(78° N, 11° E)
mCB05(EBI): R=0.36, BIAS=-2.2 ppb, NME=14.5 %
mCB05(KPP): R=0.36, BIAS=-2.5 ppb, NME=14.6 %
MOGUNTIA: R=0.56, BIAS=-1.6 ppb, NME=12.0 %
co)
Prestebakke, Norway
(59° N, 11° E)
mCB05(EBI): R=0.77, BIAS=5.3 ppb, NME=17.4 %
mCB05(KPP): R=0.77, BIAS=4.6 ppb, NME=15.0 %
MOGUNTIA: R=0.79, BIAS=5.9 ppb, NME=19.3 %
cp)
Sandve, Norway
(59° N, 5° E)
mCB05(EBI): R=0.87, BIAS=1.9 ppb, NME=10.3 %
mCB05(KPP): R=0.85, BIAS=1.2 ppb, NME=10.2 %
MOGUNTIA: R=0.78, BIAS=2.5 ppb, NME=13.1 %
cq)
Karasjok, Norway
(69° N, 25° E)
mCB05(EBI): R=0.15, BIAS=0.4 ppb, NME=21.9 %
mCB05(KPP): R=0.16, BIAS=-0.0 ppb, NME=21.7 %
MOGUNTIA: R=0.38, BIAS=1.1 ppb, NME=18.5 %
cr)
Hurdal, Norway
(60° N, 11° E)
mCB05(EBI): R=0.78, BIAS=5.9 ppb, NME=20.8 %
mCB05(KPP): R=0.78, BIAS=5.2 ppb, NME=19.1 %
MOGUNTIA: R=0.84, BIAS=6.4 ppb, NME=23.0 %
cs)
Jarczew, Poland
(51° N, 21° E)
mCB05(EBI): R=0.68, BIAS=11.8 ppb, NME=41.9 %
mCB05(KPP): R=0.67, BIAS=11.1 ppb, NME=39.3 %
MOGUNTIA: R=0.75, BIAS=13.2 ppb, NME=46.6 %
ct)
Sniezka, Poland
(50° N, 15° E)
mCB05(EBI): R=0.51, BIAS=-3.9 ppb, NME=17.4 %
mCB05(KPP): R=0.50, BIAS=-4.6 ppb, NME=18.3 %
MOGUNTIA: R=0.42, BIAS=-2.6 ppb, NME=15.0 %
cu)
Leba, Poland
(54° N, 17° E)
mCB05(EBI): R=0.77, BIAS=6.8 ppb, NME=21.3 %
mCB05(KPP): R=0.76, BIAS=5.9 ppb, NME=19.2 %
MOGUNTIA: R=0.81, BIAS=7.7 ppb, NME=24.7 %
cv)
Diabla Gora, Poland
(54° N, 22° E)
mCB05(EBI): R=0.43, BIAS=9.3 ppb, NME=34.1 %
mCB05(KPP): R=0.46, BIAS=8.4 ppb, NME=31.8 %
MOGUNTIA: R=0.62, BIAS=10.2 ppb, NME=33.7 %
cw)
Monte Velho, Portugal
(38° N, 8° W)
mCB05(EBI): R=0.53, BIAS=14.5 ppb, NME=50.0 %
mCB05(KPP): R=0.51, BIAS=12.3 ppb, NME=44.0 %
MOGUNTIA: R=0.49, BIAS=13.0 ppb, NME=45.2 %
cx)
Bredkalen, Sweden
(63° N, 15° E)
mCB05(EBI): R=0.75, BIAS=5.4 ppb, NME=20.1 %
mCB05(KPP): R=0.75, BIAS=4.8 ppb, NME=18.6 %
MOGUNTIA: R=0.82, BIAS=6.1 ppb, NME=21.6 %
cy)
Vavihill, Sweden
(56° N, 13° E)
mCB05(EBI): R=0.84, BIAS=6.0 ppb, NME=19.0 %
mCB05(KPP): R=0.84, BIAS=5.2 ppb, NME=16.7 %
MOGUNTIA: R=0.76, BIAS=6.8 ppb, NME=22.2 %
cz)
Aspvreten, Sweden
(58° N, 17° E)
mCB05(EBI): R=0.70, BIAS=3.4 ppb, NME=15.2 %
mCB05(KPP): R=0.69, BIAS=2.6 ppb, NME=14.4 %
MOGUNTIA: R=0.65, BIAS=4.0 ppb, NME=18.2 %
da)
Esrange, Sweden
(67° N, 21° E)
mCB05(EBI): R=0.33, BIAS=1.8 ppb, NME=22.5 %
mCB05(KPP): R=0.34, BIAS=1.4 ppb, NME=22.1 %
MOGUNTIA: R=0.52, BIAS=2.6 ppb, NME=18.8 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


db) Rao, Sweden (58° N, 12° E)
mCB05(EBI): R=0.70, BIAS=4.8 ppb, NME=24.1 %
mCB05(KPP): R=0.69, BIAS=4.0 ppb, NME=23.3 %
MOGUNTIA: R=0.56, BIAS=5.4 ppb, NME=27.9 %
dc) Norrakvill, Sweden (57° N, 15° E)
mCB05(EBI): R=0.75, BIAS=3.8 ppb, NME=15.8 %
mCB05(KPP): R=0.76, BIAS=3.0 ppb, NME=14.5 %
MOGUNTIA: R=0.72, BIAS=4.5 ppb, NME=18.0 %
dd) Vindeln, Sweden (64° N, 19° E)
mCB05(EBI): R=0.80, BIAS=8.2 ppb, NME=30.4 %
mCB05(KPP): R=0.81, BIAS=7.7 ppb, NME=28.5 %
MOGUNTIA: R=0.88, BIAS=9.0 ppb, NME=33.4 %
de) Grimso, Sweden (60° N, 15° E)
mCB05(EBI): R=0.74, BIAS=6.2 ppb, NME=21.4 %
mCB05(KPP): R=0.74, BIAS=5.5 ppb, NME=19.1 %
MOGUNTIA: R=0.75, BIAS=6.7 ppb, NME=23.4 %
df) Iskrba, Slovenia (45° N, 14° E)
mCB05(EBI): R=0.34, BIAS=14.3 ppb, NME=47.6 %
mCB05(KPP): R=0.33, BIAS=13.3 ppb, NME=45.0 %
MOGUNTIA: R=0.39, BIAS=14.5 ppb, NME=48.5 %
dg) Zarodnje, Slovenia (47° N, 15° E)
mCB05(EBI): R=0.72, BIAS=4.1 ppb, NME=15.8 %
mCB05(KPP): R=0.72, BIAS=3.2 ppb, NME=15.3 %
MOGUNTIA: R=0.74, BIAS=4.8 ppb, NME=17.6 %
dh) Krvavec, Slovenia (47° N, 14° E)
mCB05(EBI): R=0.70, BIAS=-7.9 ppb, NME=20.0 %
mCB05(KPP): R=0.69, BIAS=-8.8 ppb, NME=21.5 %
MOGUNTIA: R=0.68, BIAS=-7.2 ppb, NME=17.6 %
di) Kovk, Slovenia (46° N, 15° E)
mCB05(EBI): R=0.68, BIAS=7.6 ppb, NME=21.7 %
mCB05(KPP): R=0.68, BIAS=6.8 ppb, NME=19.8 %
MOGUNTIA: R=0.67, BIAS=8.2 ppb, NME=22.7 %
dj) Stara Lesna, Slovakia (49° N, 20° E)
mCB05(EBI): R=0.52, BIAS=5.9 ppb, NME=28.0 %
mCB05(KPP): R=0.53, BIAS=5.2 ppb, NME=27.2 %
MOGUNTIA: R=0.62, BIAS=7.0 ppb, NME=24.1 %
dk) Liesek, Slovakia (49° N, 19° E)
mCB05(EBI): R=0.60, BIAS=7.9 ppb, NME=29.1 %
mCB05(KPP): R=0.60, BIAS=7.2 ppb, NME=27.3 %
MOGUNTIA: R=0.68, BIAS=9.0 ppb, NME=29.2 %
dl) Topolniky, Slovakia (48° N, 18° E)
mCB05(EBI): R=0.71, BIAS=10.8 ppb, NME=35.9 %
mCB05(KPP): R=0.72, BIAS=10.1 ppb, NME=33.4 %
MOGUNTIA: R=0.74, BIAS=11.8 ppb, NME=39.0 %
dm) Ahtari, Finland (62° N, 24° E)
mCB05(EBI): R=0.87, BIAS=4.0 ppb, NME=14.5 %
mCB05(KPP): R=0.86, BIAS=3.4 ppb, NME=13.5 %
MOGUNTIA: R=0.86, BIAS=4.5 ppb, NME=15.0 %
dn) Arrival Heights, New Zealand (77° S, 166° E)
mCB05(EBI): R=0.88, BIAS=-6.9 ppb, NME=26.8 %
mCB05(KPP): R=0.88, BIAS=-6.9 ppb, NME=26.7 %
MOGUNTIA: R=0.88, BIAS=-7.8 ppb, NME=30.1 %
do) Assekrem, Algeria (23° N, 5° E)
mCB05(EBI): R=0.07, BIAS=1.6 ppb, NME=17.0 %
mCB05(KPP): R=0.06, BIAS=1.0 ppb, NME=16.6 %
MOGUNTIA: R=0.15, BIAS=0.9 ppb, NME=13.7 %
dp) Baring Head, New Zealand (41° S, 174° E)
mCB05(EBI): R=0.89, BIAS=11.1 ppb, NME=57.7 %
mCB05(KPP): R=0.89, BIAS=11.1 ppb, NME=57.8 %
MOGUNTIA: R=0.89, BIAS=9.6 ppb, NME=50.3 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


dq) Bukit Koto Tabang, Indonesia (0° S, 100° E)
mCB05(EBI): R=-0.39, BIAS=29.9 ppb, NME=235.7 %
mCB05(KPP): R=-0.39, BIAS=29.2 ppb, NME=229.5 %
MOGUNTIA: R=-0.39, BIAS=26.3 ppb, NME=207.0 %
dr) Tudor Hill, UK (32° N, 64° W)
mCB05(EBI): R=-0.48, BIAS=18.3 ppb, NME=47.5 %
mCB05(KPP): R=-0.51, BIAS=16.1 ppb, NME=42.1 %
MOGUNTIA: R=-0.44, BIAS=17.6 ppb, NME=45.6 %
ds) Barrow, USA (71° N, 156° W)
mCB05(EBI): R=-0.43, BIAS=7.5 ppb, NME=40.1 %
mCB05(KPP): R=-0.45, BIAS=7.2 ppb, NME=39.5 %
MOGUNTIA: R=-0.41, BIAS=8.2 ppb, NME=40.2 %
dt) Cape Point, South Africa (34° S, 18° E)
mCB05(EBI): R=0.95, BIAS=8.0 ppb, NME=34.5 %
mCB05(KPP): R=0.96, BIAS=8.0 ppb, NME=34.6 %
MOGUNTIA: R=0.96, BIAS=6.3 ppb, NME=27.0 %
du) Cape Point, South Africa (34° S, 18° E)
mCB05(EBI): R=0.95, BIAS=8.0 ppb, NME=34.5 %
mCB05(KPP): R=0.96, BIAS=8.0 ppb, NME=34.6 %
MOGUNTIA: R=0.96, BIAS=6.3 ppb, NME=27.0 %
dv) Giordan Lighthouse, Malta (36° N, 14° E)
mCB05(EBI): R=0.69, BIAS=6.9 ppb, NME=24.5 %
mCB05(KPP): R=0.65, BIAS=4.2 ppb, NME=24.6 %
MOGUNTIA: R=0.69, BIAS=5.1 ppb, NME=22.4 %
dw) Hohenpeissenberg, Germany (47° N, 11° E)
mCB05(EBI): R=0.59, BIAS=-0.8 ppb, NME=14.7 %
mCB05(KPP): R=0.59, BIAS=-1.7 ppb, NME=15.5 %
MOGUNTIA: R=0.62, BIAS=-0.1 ppb, NME=13.5 %
dx) Heimaey, Iceland (63° N, 20° W)
mCB05(EBI): R=0.30, BIAS=-4.8 ppb, NME=17.2 %
mCB05(KPP): R=0.31, BIAS=-5.4 ppb, NME=17.5 %
MOGUNTIA: R=0.48, BIAS=-4.1 ppb, NME=14.1 %
dy) Iskrba, Slovenia (45° N, 14° E)
mCB05(EBI): R=0.45, BIAS=13.2 ppb, NME=42.6 %
mCB05(KPP): R=0.44, BIAS=12.3 ppb, NME=39.9 %
MOGUNTIA: R=0.49, BIAS=13.5 ppb, NME=43.5 %
dz) Issykkul, Kyrgyzstan (42° N, 76° E)
mCB05(EBI): R=0.78, BIAS=6.0 ppb, NME=16.9 %
mCB05(KPP): R=0.77, BIAS=4.4 ppb, NME=15.1 %
MOGUNTIA: R=0.74, BIAS=5.1 ppb, NME=13.5 %
ea) Tenerife, Spain (28° N, 16° W)
mCB05(EBI): R=0.77, BIAS=0.5 ppb, NME=9.4 %
mCB05(KPP): R=0.73, BIAS=-1.5 ppb, NME=11.4 %
MOGUNTIA: R=0.77, BIAS=-1.0 ppb, NME=9.0 %
eb) Jungfraujoch, Switzerland (46° N, 7° E)
mCB05(EBI): R=0.72, BIAS=-9.1 ppb, NME=20.1 %
mCB05(KPP): R=0.72, BIAS=-10.0 ppb, NME=21.6 %
MOGUNTIA: R=0.72, BIAS=-8.6 ppb, NME=18.2 %
ec) Kollumerwaard, The Netherlands (53° N, 6° E)
mCB05(EBI): R=0.81, BIAS=13.6 ppb, NME=52.6 %
mCB05(KPP): R=0.80, BIAS=12.8 ppb, NME=49.4 %
MOGUNTIA: R=0.81, BIAS=14.7 ppb, NME=56.8 %
ed) Kosetice, Czech Republic (49° N, 15° E)
mCB05(EBI): R=0.56, BIAS=7.2 ppb, NME=24.5 %
mCB05(KPP): R=0.56, BIAS=6.5 ppb, NME=23.0 %
MOGUNTIA: R=0.61, BIAS=8.3 ppb, NME=25.3 %
ee) Kovk, Slovenia (46° N, 15° E)
mCB05(EBI): R=0.68, BIAS=8.0 ppb, NME=22.7 %
mCB05(KPP): R=0.68, BIAS=7.1 ppb, NME=20.8 %
MOGUNTIA: R=0.67, BIAS=8.5 ppb, NME=23.9 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA



ef) Krvavec, Slovenia (46° N, 14° E)
mCB05(EBI): R=0.70, BIAS=-6.1 ppb, NME=17.2 %
mCB05(KPP): R=0.69, BIAS=-6.9 ppb, NME=18.8 %
MOGUNTIA: R=0.68, BIAS=-5.5 ppb, NME=15.6 %
eg) Lauder, New Zealand (45° S, 169° E)
mCB05(EBI): R=0.64, BIAS=11.1 ppb, NME=62.1 %
mCB05(KPP): R=0.64, BIAS=11.1 ppb, NME=62.3 %
MOGUNTIA: R=0.66, BIAS=9.8 ppb, NME=55.2 %
eh) Waldhof, Germany (52° N, 10° E)
mCB05(EBI): R=0.75, BIAS=11.8 ppb, NME=44.3 %
mCB05(KPP): R=0.74, BIAS=11.1 ppb, NME=41.9 %
MOGUNTIA: R=0.71, BIAS=13.0 ppb, NME=49.2 %
ei) Mace Head, Ireland (53° N, 9° W)
mCB05(EBI): R=0.24, BIAS=2.1 ppb, NME=18.8 %
mCB05(KPP): R=0.21, BIAS=1.2 ppb, NME=18.0 %
MOGUNTIA: R=0.33, BIAS=3.2 ppb, NME=15.1 %
ej) Mauna Loa, USA (19° N, 155° W)
mCB05(EBI): R=0.16, BIAS=-0.6 ppb, NME=20.4 %
mCB05(KPP): R=0.13, BIAS=-1.1 ppb, NME=20.5 %
MOGUNTIA: R=0.24, BIAS=-1.4 ppb, NME=18.6 %
ek) Neuglobsow, Germany (53° N, 13° E)
mCB05(EBI): R=0.75, BIAS=12.2 ppb, NME=46.3 %
mCB05(KPP): R=0.74, BIAS=11.4 ppb, NME=43.7 %
MOGUNTIA: R=0.73, BIAS=13.3 ppb, NME=51.0 %
el) Neumayer, Antarctica (70° S, 8° W)
mCB05(EBI): R=0.95, BIAS=-3.6 ppb, NME=15.7 %
mCB05(KPP): R=0.95, BIAS=-3.6 ppb, NME=15.5 %
MOGUNTIA: R=0.95, BIAS=-4.6 ppb, NME=18.5 %
em) Niwot Ridge (C1), USA (40° N, 105° W)
mCB05(EBI): R=0.72, BIAS=-4.1 ppb, NME=10.8 %
mCB05(KPP): R=0.70, BIAS=-5.8 ppb, NME=13.4 %
MOGUNTIA: R=0.70, BIAS=-5.2 ppb, NME=11.5 %
en) Oulanka, Finland (66° N, 29° E)
mCB05(EBI): R=0.44, BIAS=2.0 ppb, NME=21.7 %
mCB05(KPP): R=0.44, BIAS=1.6 ppb, NME=21.2 %
MOGUNTIA: R=0.58, BIAS=2.8 ppb, NME=17.8 %
eo) Pallassammaltunturi, Finland (67° N, 24° E)
mCB05(EBI): R=0.30, BIAS=-1.5 ppb, NME=17.5 %
mCB05(KPP): R=0.31, BIAS=-1.9 ppb, NME=17.4 %
MOGUNTIA: R=0.48, BIAS=-0.7 ppb, NME=14.1 %
ep) Payerne, Switzerland (46° N, 6° E)
mCB05(EBI): R=0.75, BIAS=16.4 ppb, NME=60.3 %
mCB05(KPP): R=0.75, BIAS=15.5 ppb, NME=57.1 %
MOGUNTIA: R=0.77, BIAS=16.9 ppb, NME=62.3 %
eq) Rucava, Latvia (56° N, 21° E)
mCB05(EBI): R=0.36, BIAS=-5.6 ppb, NME=27.8 %
mCB05(KPP): R=0.33, BIAS=-6.4 ppb, NME=28.9 %
MOGUNTIA: R=0.45, BIAS=-4.9 ppb, NME=29.1 %
er) Rigi, Switzerland (46° N, 8° E)
mCB05(EBI): R=0.67, BIAS=0.9 ppb, NME=13.7 %
mCB05(KPP): R=0.67, BIAS=0.1 ppb, NME=13.2 %
MOGUNTIA: R=0.66, BIAS=1.5 ppb, NME=13.2 %
es) Ryori, Japan (39° N, 141° E)
mCB05(EBI): R=-0.15, BIAS=7.0 ppb, NME=23.0 %
mCB05(KPP): R=-0.17, BIAS=5.2 ppb, NME=23.8 %
MOGUNTIA: R=-0.16, BIAS=5.8 ppb, NME=22.2 %
et) Tutuila (Cape Matatula), USA (14° S, 170° W)
mCB05(EBI): R=0.92, BIAS=21.9 ppb, NME=171.7 %
mCB05(KPP): R=0.92, BIAS=21.9 ppb, NME=171.2 %
MOGUNTIA: R=0.93, BIAS=19.4 ppb, NME=152.1 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


eu) Sonnblick, Austria (47° N, 12° E)
mCB05(EBI): R=0.60, BIAS=-7.6 ppb, NME=19.4 %
mCB05(KPP): R=0.59, BIAS=-8.5 ppb, NME=20.9 %
MOGUNTIA: R=0.63, BIAS=-6.9 ppb, NME=17.0 %
ev) South Pole, USA (89° S, 24° W)
mCB05(EBI): R=0.91, BIAS=-13.1 ppb, NME=45.3 %
mCB05(KPP): R=0.91, BIAS=-13.1 ppb, NME=45.3 %
MOGUNTIA: R=0.93, BIAS=-13.9 ppb, NME=48.0 %
ew) Schauinsland, Germany (47° N, 7° E)
mCB05(EBI): R=0.62, BIAS=-1.9 ppb, NME=14.5 %
mCB05(KPP): R=0.63, BIAS=-2.7 ppb, NME=15.4 %
MOGUNTIA: R=0.63, BIAS=-1.1 ppb, NME=13.9 %
ex) Summit, Denmark (72° N, 38° W)
mCB05(EBI): R=0.66, BIAS=-12.6 ppb, NME=27.0 %
mCB05(KPP): R=0.67, BIAS=-13.0 ppb, NME=27.9 %
MOGUNTIA: R=0.79, BIAS=-12.0 ppb, NME=25.7 %
ey) Syowa Station, Japan (69° S, 39° E)
mCB05(EBI): R=0.91, BIAS=-2.4 ppb, NME=11.9 %
mCB05(KPP): R=0.91, BIAS=-2.4 ppb, NME=11.7 %
MOGUNTIA: R=0.92, BIAS=-3.3 ppb, NME=14.7 %
ez) Trinidad Head, USA (41° N, 124° W)
mCB05(EBI): R=-0.27, BIAS=16.1 ppb, NME=51.1 %
mCB05(KPP): R=-0.29, BIAS=14.5 ppb, NME=45.9 %
MOGUNTIA: R=-0.24, BIAS=15.2 ppb, NME=48.1 %
fa) Tsukuba, Japan (36° N, 140° E)
mCB05(EBI): R=0.71, BIAS=24.4 ppb, NME=104.5 %
mCB05(KPP): R=0.66, BIAS=21.7 ppb, NME=92.8 %
MOGUNTIA: R=0.68, BIAS=22.6 ppb, NME=96.7 %
fb) Uto, Finland (59° N, 21° E)
mCB05(EBI): R=0.90, BIAS=-1.3 ppb, NME=6.8 %
mCB05(KPP): R=0.89, BIAS=-2.0 ppb, NME=7.5 %
MOGUNTIA: R=0.79, BIAS=-0.7 ppb, NME=8.6 %
fc) Vindeln, Sweden (64° N, 19° E)
mCB05(EBI): R=0.80, BIAS=8.4 ppb, NME=31.8 %
mCB05(KPP): R=0.81, BIAS=7.9 ppb, NME=29.8 %
MOGUNTIA: R=0.88, BIAS=9.2 ppb, NME=34.8 %
fd) Virolahti, Finland (60° N, 27° E)
mCB05(EBI): R=0.86, BIAS=1.7 ppb, NME=8.1 %
mCB05(KPP): R=0.85, BIAS=1.0 ppb, NME=8.0 %
MOGUNTIA: R=0.79, BIAS=2.3 ppb, NME=10.2 %
fe) Westerland, Germany (54° N, 8° E)
mCB05(EBI): R=0.90, BIAS=4.5 ppb, NME=15.0 %
mCB05(KPP): R=0.89, BIAS=3.7 ppb, NME=13.9 %
MOGUNTIA: R=0.82, BIAS=5.5 ppb, NME=19.0 %
ff) Yonagunijima, Japan (24° N, 123° E)
mCB05(EBI): R=-0.73, BIAS=3.1 ppb, NME=32.8 %
mCB05(KPP): R=-0.73, BIAS=2.5 ppb, NME=33.0 %
MOGUNTIA: R=-0.73, BIAS=2.5 ppb, NME=30.5 %
fg) Zingst, Germany (54° N, 12° E)
mCB05(EBI): R=0.85, BIAS=8.7 ppb, NME=28.1 %
mCB05(KPP): R=0.85, BIAS=7.8 ppb, NME=25.6 %
MOGUNTIA: R=0.84, BIAS=9.6 ppb, NME=31.7 %
fh) Zavodnje, Slovenia (46° N, 15° E)
mCB05(EBI): R=0.72, BIAS=5.8 ppb, NME=17.8 %
mCB05(KPP): R=0.72, BIAS=4.9 ppb, NME=16.6 %
MOGUNTIA: R=0.74, BIAS=6.3 ppb, NME=18.9 %
fi) Zugspitze Schneefernerhaus, Germany (47° N, 10° E)
mCB05(EBI): R=0.64, BIAS=-7.8 ppb, NME=19.8 %
mCB05(KPP): R=0.64, BIAS=-8.7 ppb, NME=21.3 %
MOGUNTIA: R=0.64, BIAS=-7.1 ppb, NME=17.4 %
Ozone(ppb)
J F M A M J J A S O N D
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

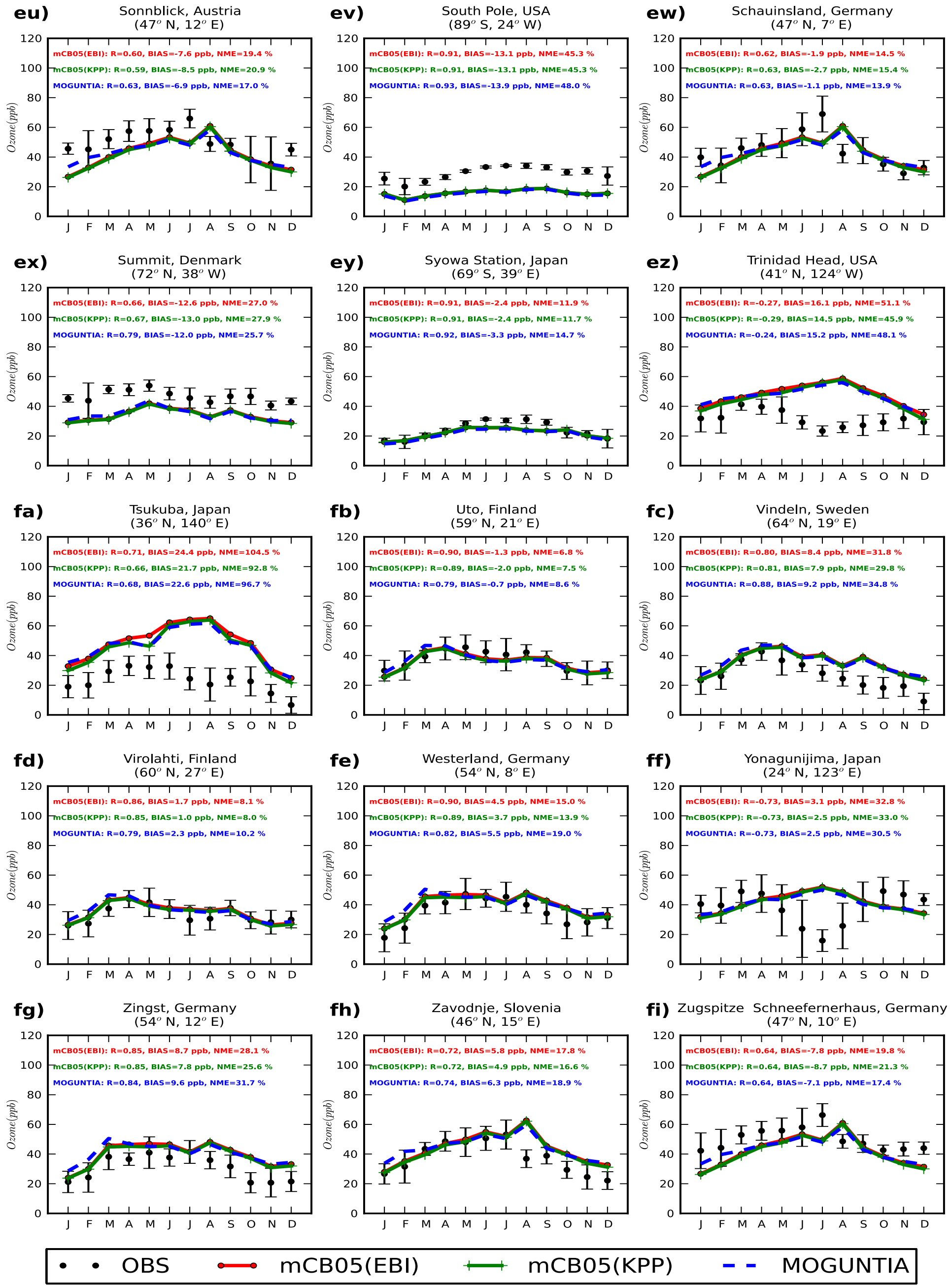
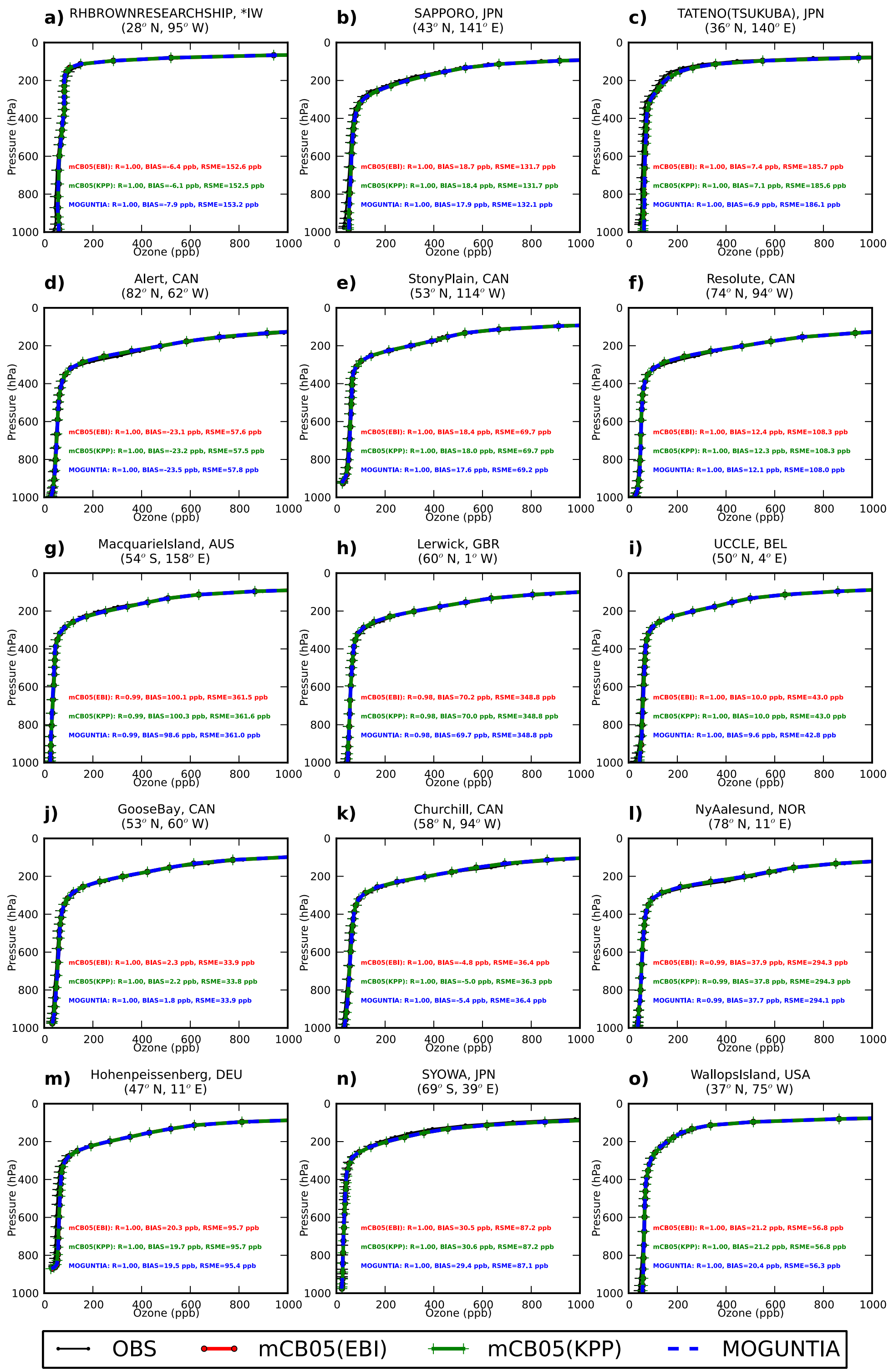
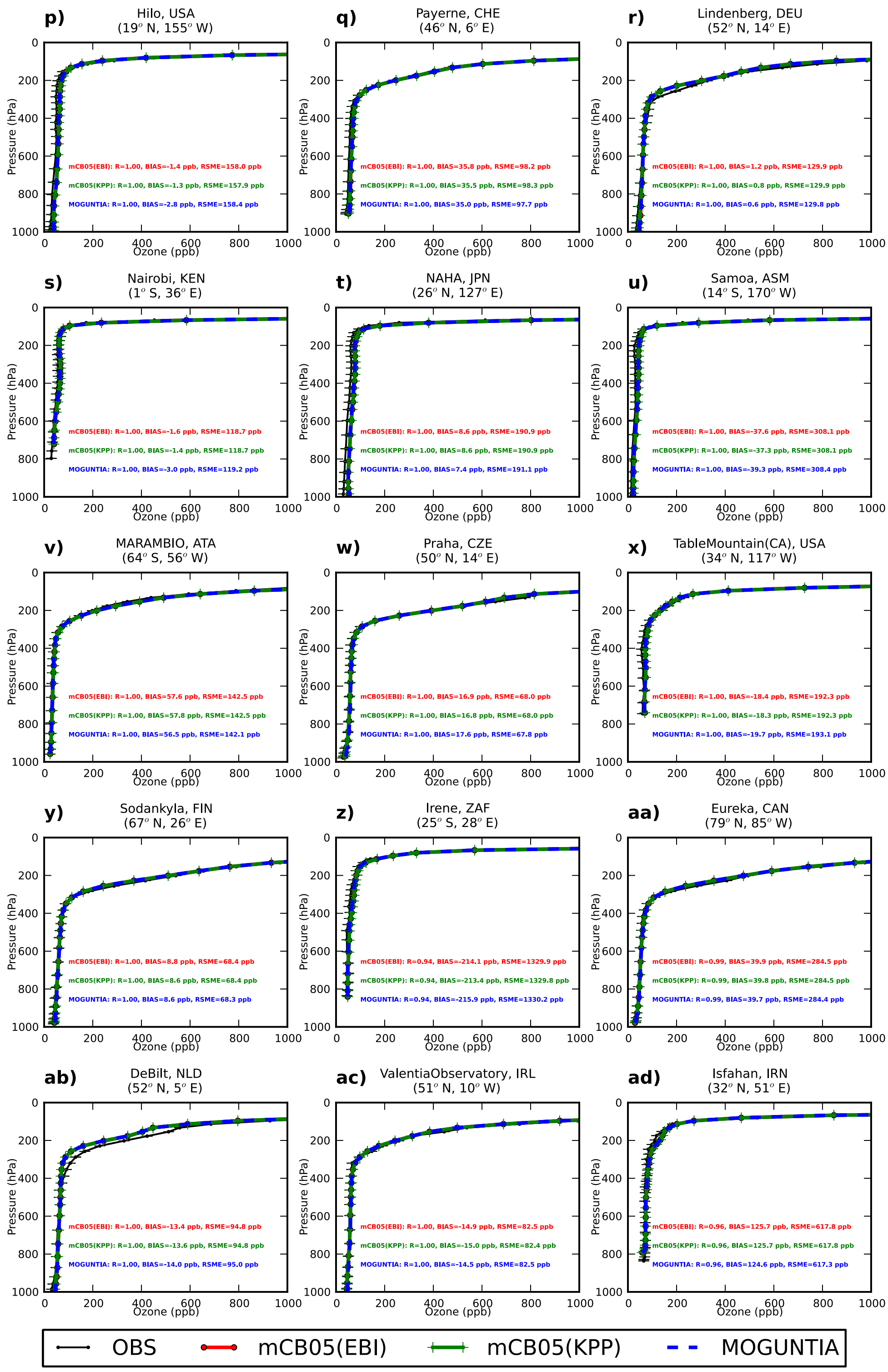
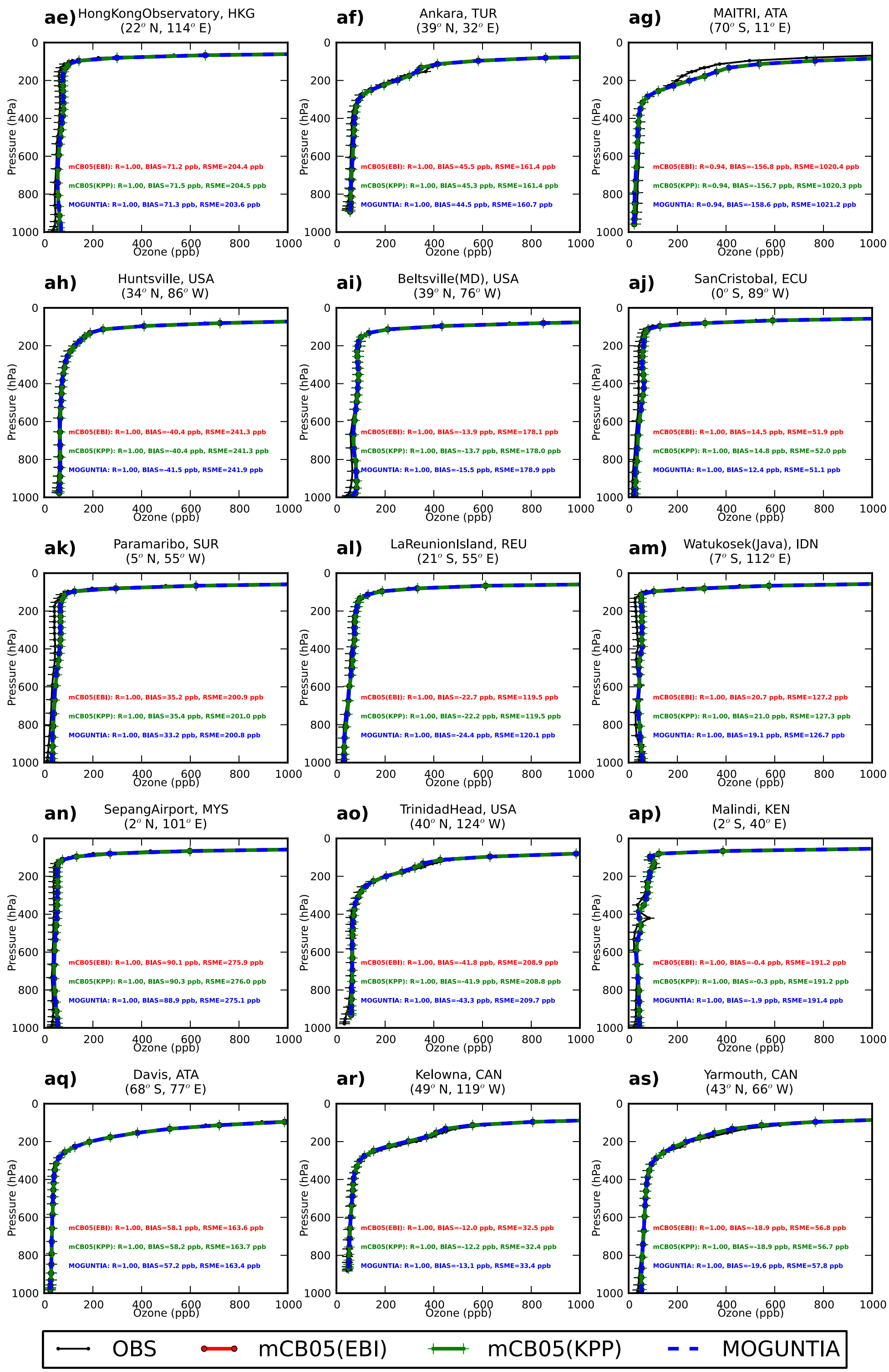


Figure S 1: Comparison of monthly mean surface O_3 observations (black dots) in ppb with model results (red-line for mCB05(EBI), green-line for mCB05(KPP) and blue-line for MOGUNTIA) at various stations around the globe, as obtained from the European Monitoring and Evaluation Programme (EMEP; http://www.emep.int) and the World Data Centre for Greenhouse Gases (WDCGG; http://ds.data.jma.go.jp/gmd/wdcgg/introduction.html), for the year 2006.



a) RHBROWNRESEARCHSHIP, *IW (28° N, 95° W)
mCB05(EBI): R=1.00, BIAS=-6.4 ppb, RSME=152.6 ppb
mCB05(KPP): R=1.00, BIAS=-6.1 ppb, RSME=152.5 ppb
MOGUNTIA: R=1.00, BIAS=-7.9 ppb, RSME=153.2 ppb
b) SAPPORO, JPN (43° N, 141° E)
mCB05(EBI): R=1.00, BIAS=18.7 ppb, RSME=131.7 ppb
mCB05(KPP): R=1.00, BIAS=18.4 ppb, RSME=131.7 ppb
MOGUNTIA: R=1.00, BIAS=17.9 ppb, RSME=132.1 ppb
c) TATENO(TSUKUBA), JPN (36° N, 140° E)
mCB05(EBI): R=1.00, BIAS=7.4 ppb, RSME=185.7 ppb
mCB05(KPP): R=1.00, BIAS=7.1 ppb, RSME=185.6 ppb
MOGUNTIA: R=1.00, BIAS=6.9 ppb, RSME=186.1 ppb
d) Alert, CAN (82° N, 62° W)
mCB05(EBI): R=1.00, BIAS=-23.1 ppb, RSME=57.6 ppb
mCB05(KPP): R=1.00, BIAS=-23.2 ppb, RSME=57.5 ppb
MOGUNTIA: R=1.00, BIAS=-23.5 ppb, RSME=57.8 ppb
e) StonyPlain, CAN (53° N, 114° W)
mCB05(EBI): R=1.00, BIAS=18.4 ppb, RSME=69.7 ppb
mCB05(KPP): R=1.00, BIAS=18.0 ppb, RSME=69.7 ppb
MOGUNTIA: R=1.00, BIAS=17.6 ppb, RSME=69.2 ppb
f) Resolute, CAN (74° N, 94° W)
mCB05(EBI): R=1.00, BIAS=12.4 ppb, RSME=108.3 ppb
mCB05(KPP): R=1.00, BIAS=12.3 ppb, RSME=108.3 ppb
MOGUNTIA: R=1.00, BIAS=12.1 ppb, RSME=108.0 ppb
g) MacquarieIsland, AUS (54° S, 158° E)
mCB05(EBI): R=0.99, BIAS=100.1 ppb, RSME=361.5 ppb
mCB05(KPP): R=0.99, BIAS=100.3 ppb, RSME=361.6 ppb
MOGUNTIA: R=0.99, BIAS=98.6 ppb, RSME=361.0 ppb
h) Lerwick, GBR (60° N, 1° W)
mCB05(EBI): R=0.98, BIAS=70.2 ppb, RSME=348.8 ppb
mCB05(KPP): R=0.98, BIAS=70.0 ppb, RSME=348.8 ppb
MOGUNTIA: R=0.98, BIAS=69.7 ppb, RSME=348.8 ppb
i) UCCLE, BEL (50° N, 4° E)
mCB05(EBI): R=1.00, BIAS=10.0 ppb, RSME=43.0 ppb
mCB05(KPP): R=1.00, BIAS=10.0 ppb, RSME=43.0 ppb
MOGUNTIA: R=1.00, BIAS=9.6 ppb, RSME=42.8 ppb
j) GooseBay, CAN (53° N, 60° W)
mCB05(EBI): R=1.00, BIAS=2.3 ppb, RSME=33.9 ppb
mCB05(KPP): R=1.00, BIAS=2.2 ppb, RSME=33.8 ppb
MOGUNTIA: R=1.00, BIAS=1.8 ppb, RSME=33.9 ppb
k) Churchill, CAN (58° N, 94° W)
mCB05(EBI): R=1.00, BIAS=-4.8 ppb, RSME=36.4 ppb
mCB05(KPP): R=1.00, BIAS=-5.0 ppb, RSME=36.3 ppb
MOGUNTIA: R=1.00, BIAS=-5.4 ppb, RSME=36.4 ppb
l) NyAalesund, NOR (78° N, 11° E)
mCB05(EBI): R=0.99, BIAS=37.9 ppb, RSME=294.3 ppb
mCB05(KPP): R=0.99, BIAS=37.8 ppb, RSME=294.3 ppb
MOGUNTIA: R=0.99, BIAS=37.7 ppb, RSME=294.1 ppb
m) Hohenpeissenberg, DEU (47° N, 11° E)
mCB05(EBI): R=1.00, BIAS=20.3 ppb, RSME=95.7 ppb
mCB05(KPP): R=1.00, BIAS=19.7 ppb, RSME=95.7 ppb
MOGUNTIA: R=1.00, BIAS=19.5 ppb, RSME=95.4 ppb
n) SYOWA, JPN (69° S, 39° E)
mCB05(EBI): R=1.00, BIAS=30.5 ppb, RSME=87.2 ppb
mCB05(KPP): R=1.00, BIAS=30.6 ppb, RSME=87.2 ppb
MOGUNTIA: R=1.00, BIAS=29.4 ppb, RSME=87.1 ppb
o) WallopsIsland, USA (37° N, 75° W)
mCB05(EBI): R=1.00, BIAS=21.2 ppb, RSME=56.8 ppb
mCB05(KPP): R=1.00, BIAS=21.2 ppb, RSME=56.8 ppb
MOGUNTIA: R=1.00, BIAS=20.4 ppb, RSME=56.3 ppb
Pressure (hPa)
Ozone (ppb)
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


p) Hilo, USA (19° N, 155° W)
mCB05(EBI): R=1.00, BIAS=-1.4 ppb, RSME=158.0 ppb
mCB05(KPP): R=1.00, BIAS=-1.3 ppb, RSME=157.9 ppb
MOGUNTIA: R=1.00, BIAS=-2.8 ppb, RSME=158.4 ppb
q) Payerne, CHE (46° N, 6° E)
mCB05(EBI): R=1.00, BIAS=35.8 ppb, RSME=98.2 ppb
mCB05(KPP): R=1.00, BIAS=35.5 ppb, RSME=98.3 ppb
MOGUNTIA: R=1.00, BIAS=35.0 ppb, RSME=97.7 ppb
r) Lindenberg, DEU (52° N, 14° E)
mCB05(EBI): R=1.00, BIAS=1.2 ppb, RSME=129.9 ppb
mCB05(KPP): R=1.00, BIAS=0.8 ppb, RSME=129.9 ppb
MOGUNTIA: R=1.00, BIAS=0.6 ppb, RSME=129.8 ppb
s) Nairobi, KEN (1° S, 36° E)
mCB05(EBI): R=1.00, BIAS=-1.6 ppb, RSME=118.7 ppb
mCB05(KPP): R=1.00, BIAS=-1.4 ppb, RSME=118.7 ppb
MOGUNTIA: R=1.00, BIAS=-3.0 ppb, RSME=119.2 ppb
t) NAHA, JPN (26° N, 127° E)
mCB05(EBI): R=1.00, BIAS=8.6 ppb, RSME=190.9 ppb
mCB05(KPP): R=1.00, BIAS=8.6 ppb, RSME=190.9 ppb
MOGUNTIA: R=1.00, BIAS=7.4 ppb, RSME=191.1 ppb
u) Samoa, ASM (14° S, 170° W)
mCB05(EBI): R=1.00, BIAS=-37.6 ppb, RSME=308.1 ppb
mCB05(KPP): R=1.00, BIAS=-37.3 ppb, RSME=308.1 ppb
MOGUNTIA: R=1.00, BIAS=-39.3 ppb, RSME=308.4 ppb
v) MARAMBIO, ATA (64° S, 56° W)
mCB05(EBI): R=1.00, BIAS=57.6 ppb, RSME=142.5 ppb
mCB05(KPP): R=1.00, BIAS=57.8 ppb, RSME=142.5 ppb
MOGUNTIA: R=1.00, BIAS=56.5 ppb, RSME=142.1 ppb
w) Praha, CZE (50° N, 14° E)
mCB05(EBI): R=1.00, BIAS=16.9 ppb, RSME=68.0 ppb
mCB05(KPP): R=1.00, BIAS=16.8 ppb, RSME=68.0 ppb
MOGUNTIA: R=1.00, BIAS=17.6 ppb, RSME=67.8 ppb
x) TableMountain(CA), USA (34° N, 117° W)
mCB05(EBI): R=1.00, BIAS=-18.4 ppb, RSME=192.3 ppb
mCB05(KPP): R=1.00, BIAS=-18.3 ppb, RSME=192.3 ppb
MOGUNTIA: R=1.00, BIAS=-19.7 ppb, RSME=193.1 ppb
y) Sodankyla, FIN (67° N, 26° E)
mCB05(EBI): R=1.00, BIAS=8.8 ppb, RSME=68.4 ppb
mCB05(KPP): R=1.00, BIAS=8.6 ppb, RSME=68.4 ppb
MOGUNTIA: R=1.00, BIAS=8.6 ppb, RSME=68.3 ppb
z) Irene, ZAF (25° S, 28° E)
mCB05(EBI): R=0.94, BIAS=-214.1 ppb, RSME=1329.9 ppb
mCB05(KPP): R=0.94, BIAS=-213.4 ppb, RSME=1329.8 ppb
MOGUNTIA: R=0.94, BIAS=-215.9 ppb, RSME=1330.2 ppb
aa) Eureka, CAN (79° N, 85° W)
mCB05(EBI): R=0.99, BIAS=39.9 ppb, RSME=284.5 ppb
mCB05(KPP): R=0.99, BIAS=39.8 ppb, RSME=284.5 ppb
MOGUNTIA: R=0.99, BIAS=39.7 ppb, RSME=284.4 ppb
ab) DeBilt, NLD (52° N, 5° E)
mCB05(EBI): R=1.00, BIAS=-13.4 ppb, RSME=94.8 ppb
mCB05(KPP): R=1.00, BIAS=-13.6 ppb, RSME=94.8 ppb
MOGUNTIA: R=1.00, BIAS=-14.0 ppb, RSME=95.0 ppb
ac) ValentiaObservatory, IRL (51° N, 10° W)
mCB05(EBI): R=1.00, BIAS=-14.9 ppb, RSME=82.5 ppb
mCB05(KPP): R=1.00, BIAS=-15.0 ppb, RSME=82.4 ppb
MOGUNTIA: R=1.00, BIAS=-14.5 ppb, RSME=82.5 ppb
ad) Isfahan, IRN (32° N, 51° E)
mCB05(EBI): R=0.96, BIAS=125.7 ppb, RSME=617.8 ppb
mCB05(KPP): R=0.96, BIAS=125.7 ppb, RSME=617.8 ppb
MOGUNTIA: R=0.96, BIAS=124.6 ppb, RSME=617.3 ppb
Pressure (hPa)
Ozone (ppb)
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


ae) HongKongObservatory, HKG (22° N, 114° E)
mCB05(EBI): R=1.00, BIAS=71.2 ppb, RSME=204.4 ppb
mCB05(KPP): R=1.00, BIAS=71.5 ppb, RSME=204.5 ppb
MOGUNTIA: R=1.00, BIAS=71.3 ppb, RSME=203.6 ppb
af) Ankara, TUR (39° N, 32° E)
mCB05(EBI): R=1.00, BIAS=45.5 ppb, RSME=161.4 ppb
mCB05(KPP): R=1.00, BIAS=45.3 ppb, RSME=161.4 ppb
MOGUNTIA: R=1.00, BIAS=44.5 ppb, RSME=160.7 ppb
ag) MAITRI, ATA (70° S, 11° E)
mCB05(EBI): R=0.94, BIAS=-156.8 ppb, RSME=1020.4 ppb
mCB05(KPP): R=0.94, BIAS=-156.7 ppb, RSME=1020.3 ppb
MOGUNTIA: R=0.94, BIAS=-158.6 ppb, RSME=1021.2 ppb
ah) Huntsville, USA (34° N, 86° W)
mCB05(EBI): R=1.00, BIAS=-40.4 ppb, RSME=241.3 ppb
mCB05(KPP): R=1.00, BIAS=-40.4 ppb, RSME=241.3 ppb
MOGUNTIA: R=1.00, BIAS=-41.5 ppb, RSME=241.9 ppb
ai) Beltsville(MD), USA (39° N, 76° W)
mCB05(EBI): R=1.00, BIAS=-13.9 ppb, RSME=178.1 ppb
mCB05(KPP): R=1.00, BIAS=-13.7 ppb, RSME=178.0 ppb
MOGUNTIA: R=1.00, BIAS=-15.5 ppb, RSME=178.9 ppb
aj) SanCristobal, ECU (0° S, 89° W)
mCB05(EBI): R=1.00, BIAS=14.5 ppb, RSME=51.9 ppb
mCB05(KPP): R=1.00, BIAS=14.8 ppb, RSME=52.0 ppb
MOGUNTIA: R=1.00, BIAS=12.4 ppb, RSME=51.1 ppb
ak) Paramaribo, SUR (5° N, 55° W)
mCB05(EBI): R=1.00, BIAS=35.2 ppb, RSME=200.9 ppb
mCB05(KPP): R=1.00, BIAS=35.4 ppb, RSME=201.0 ppb
MOGUNTIA: R=1.00, BIAS=33.2 ppb, RSME=200.8 ppb
al) LaReunionIsland, REU (21° S, 55° E)
mCB05(EBI): R=1.00, BIAS=-22.7 ppb, RSME=119.5 ppb
mCB05(KPP): R=1.00, BIAS=-22.2 ppb, RSME=119.5 ppb
MOGUNTIA: R=1.00, BIAS=-24.4 ppb, RSME=120.1 ppb
am) Watukosek(Java), IDN (7° S, 112° E)
mCB05(EBI): R=1.00, BIAS=20.7 ppb, RSME=127.2 ppb
mCB05(KPP): R=1.00, BIAS=21.0 ppb, RSME=127.3 ppb
MOGUNTIA: R=1.00, BIAS=19.1 ppb, RSME=126.7 ppb
an) SepangAirport, MYS (2° N, 101° E)
mCB05(EBI): R=1.00, BIAS=90.1 ppb, RSME=275.9 ppb
mCB05(KPP): R=1.00, BIAS=90.3 ppb, RSME=276.0 ppb
MOGUNTIA: R=1.00, BIAS=88.9 ppb, RSME=275.1 ppb
ao) TrinidadHead, USA (40° N, 124° W)
mCB05(EBI): R=1.00, BIAS=-41.8 ppb, RSME=208.9 ppb
mCB05(KPP): R=1.00, BIAS=-41.9 ppb, RSME=208.8 ppb
MOGUNTIA: R=1.00, BIAS=-43.3 ppb, RSME=209.7 ppb
ap) Malindi, KEN (2° S, 40° E)
mCB05(EBI): R=1.00, BIAS=-0.4 ppb, RSME=191.2 ppb
mCB05(KPP): R=1.00, BIAS=-0.3 ppb, RSME=191.2 ppb
MOGUNTIA: R=1.00, BIAS=-1.9 ppb, RSME=191.4 ppb
aq) Davis, ATA (68° S, 77° E)
mCB05(EBI): R=1.00, BIAS=58.1 ppb, RSME=163.6 ppb
mCB05(KPP): R=1.00, BIAS=58.2 ppb, RSME=163.7 ppb
MOGUNTIA: R=1.00, BIAS=57.2 ppb, RSME=163.4 ppb
ar) Kelowna, CAN (49° N, 119° W)
mCB05(EBI): R=1.00, BIAS=-12.0 ppb, RSME=32.5 ppb
mCB05(KPP): R=1.00, BIAS=-12.2 ppb, RSME=32.4 ppb
MOGUNTIA: R=1.00, BIAS=-13.1 ppb, RSME=33.4 ppb
as) Yarmouth, CAN (43° N, 66° W)
mCB05(EBI): R=1.00, BIAS=-18.9 ppb, RSME=56.8 ppb
mCB05(KPP): R=1.00, BIAS=-18.9 ppb, RSME=56.7 ppb
MOGUNTIA: R=1.00, BIAS=-19.6 ppb, RSME=57.8 ppb
Pressure (hPa)
Ozone (ppb)
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

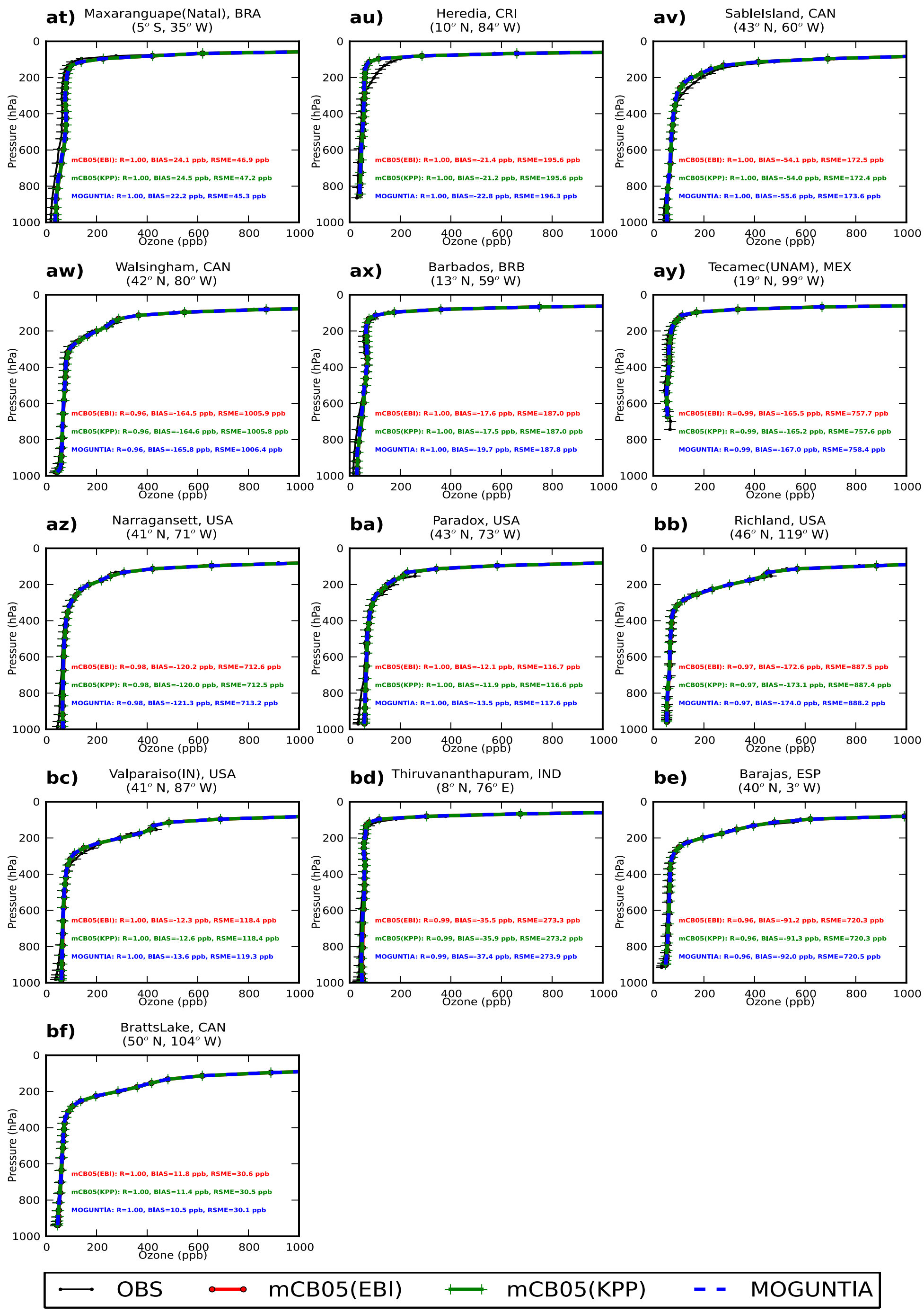


Figure S 2: Comparison of monthly mean ozone sonde observations (black line) in ppb with model results (red-line for mCB05 configuration using the EBI solver, green-line for mCB05 configuration using the solver as generated by the KPP software and blue-line for MOGUNTIA configuration) at various stations around the globe, as obtained from the World Data Centre for Greenhouse Gases (WDCGG; https://gaw.kishou.go.jp), for the year 2006.

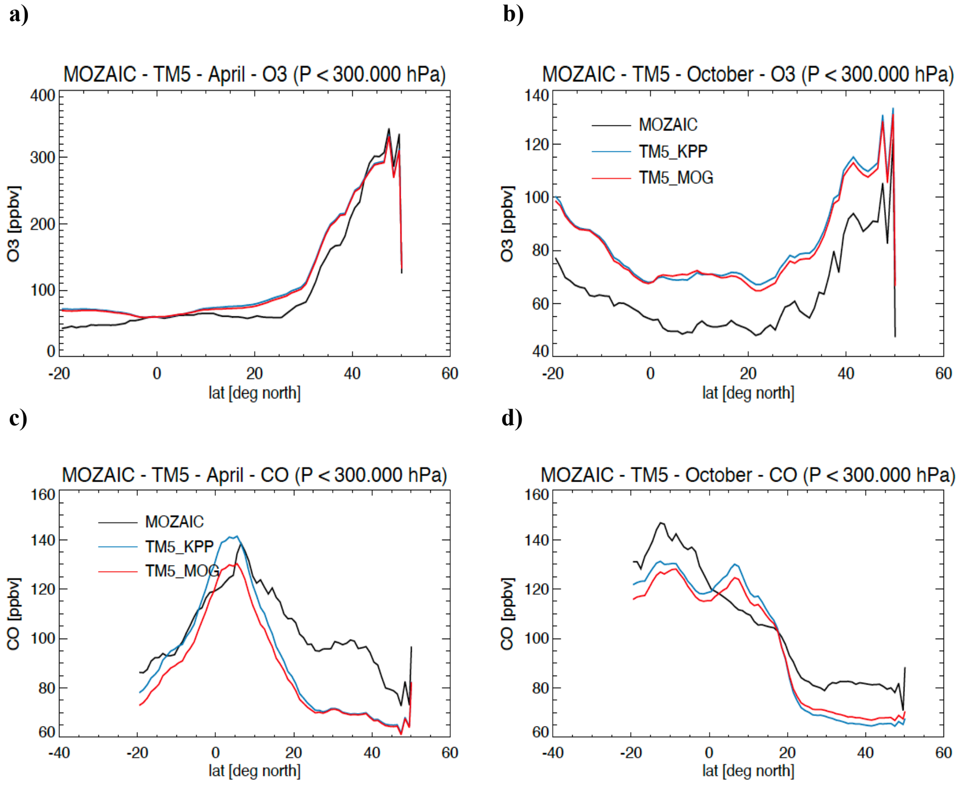
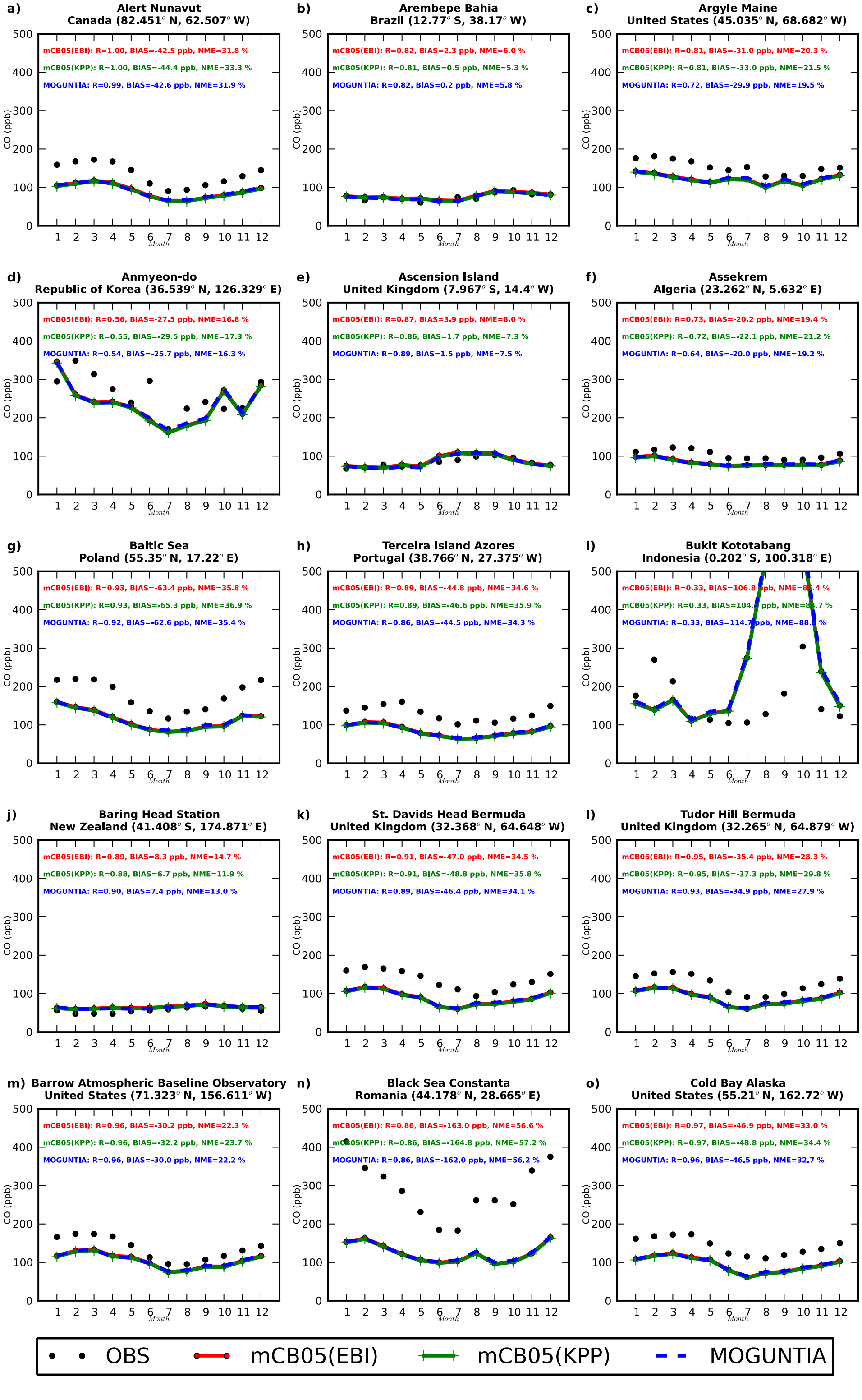
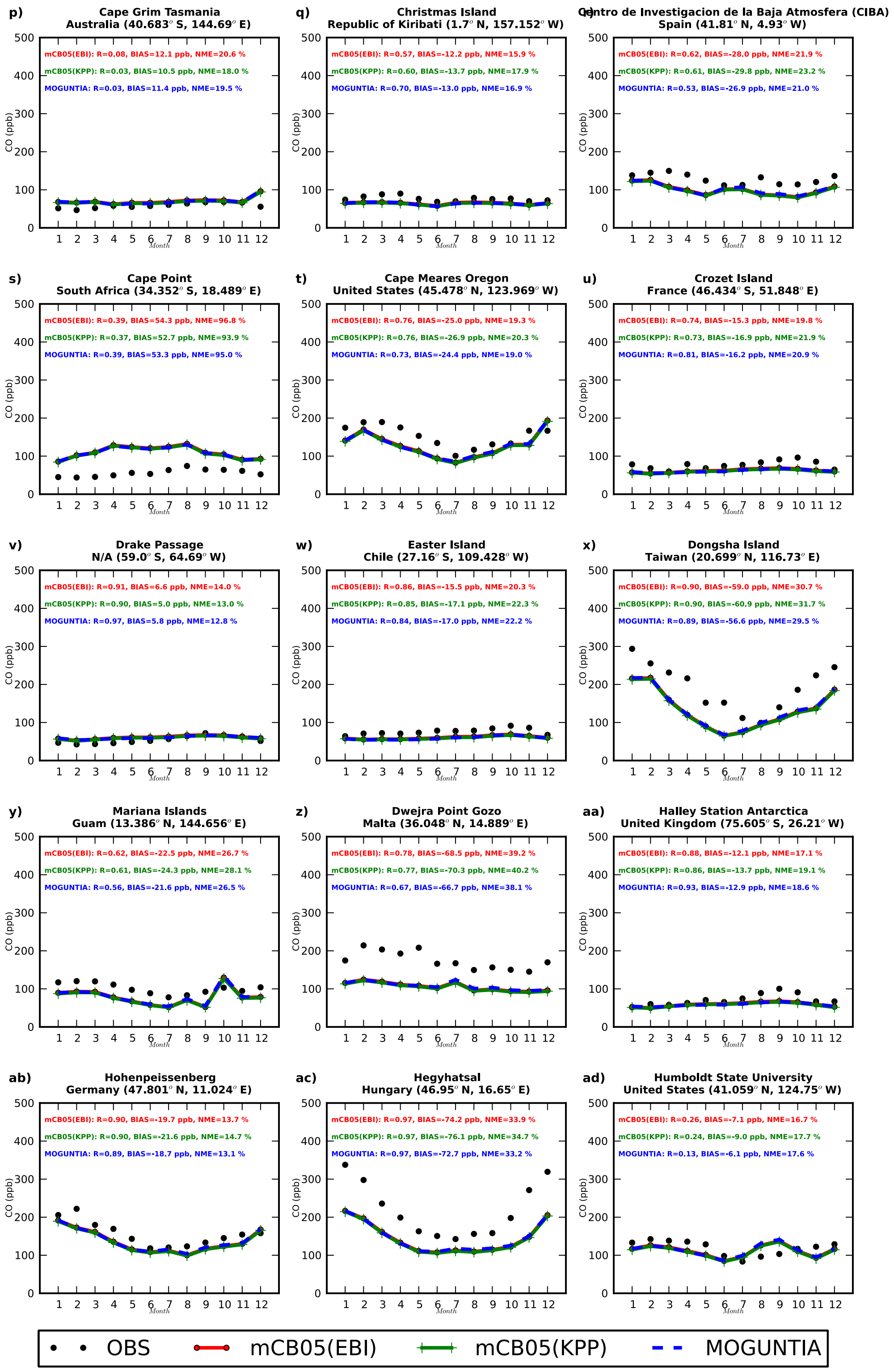
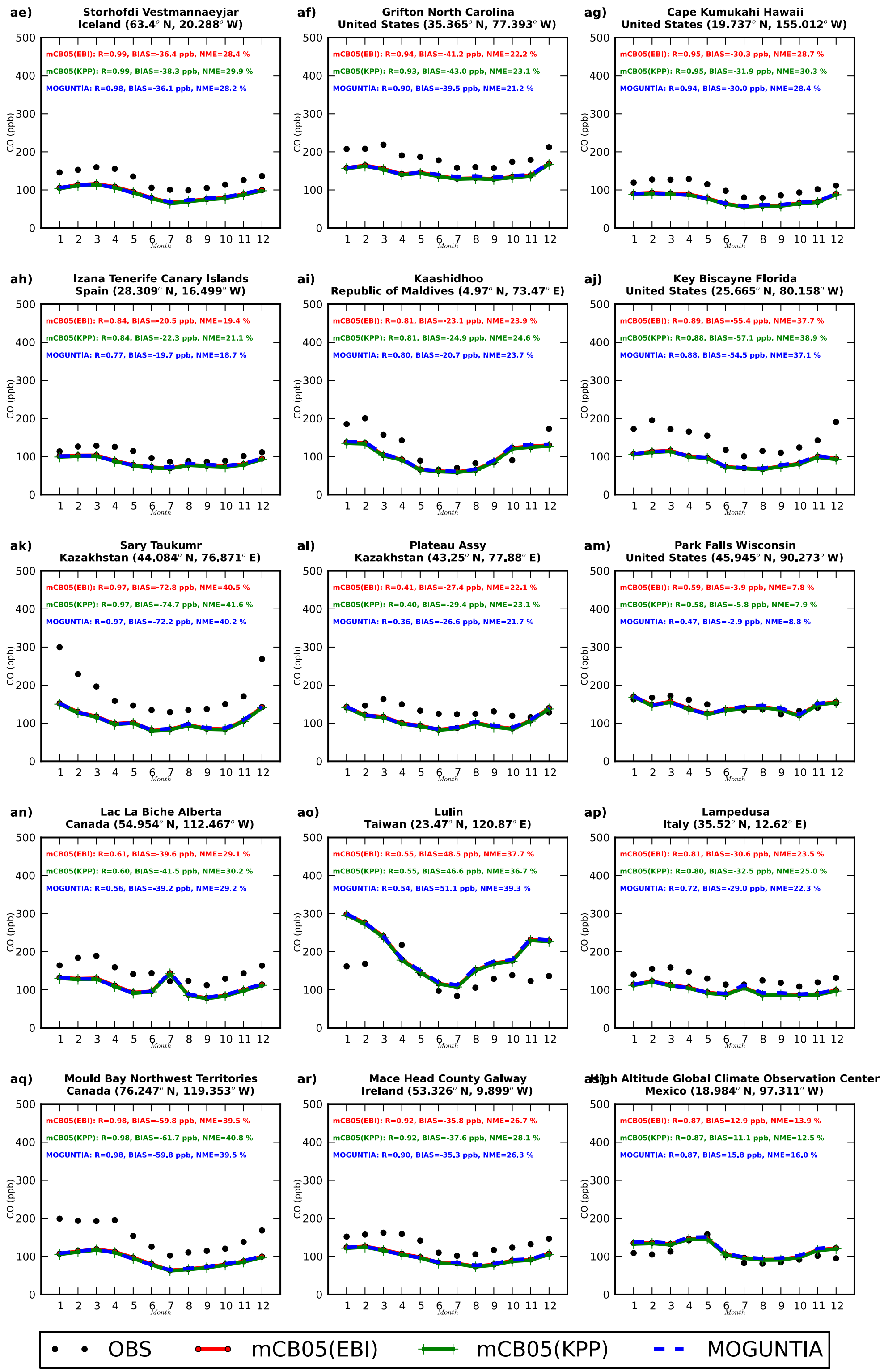


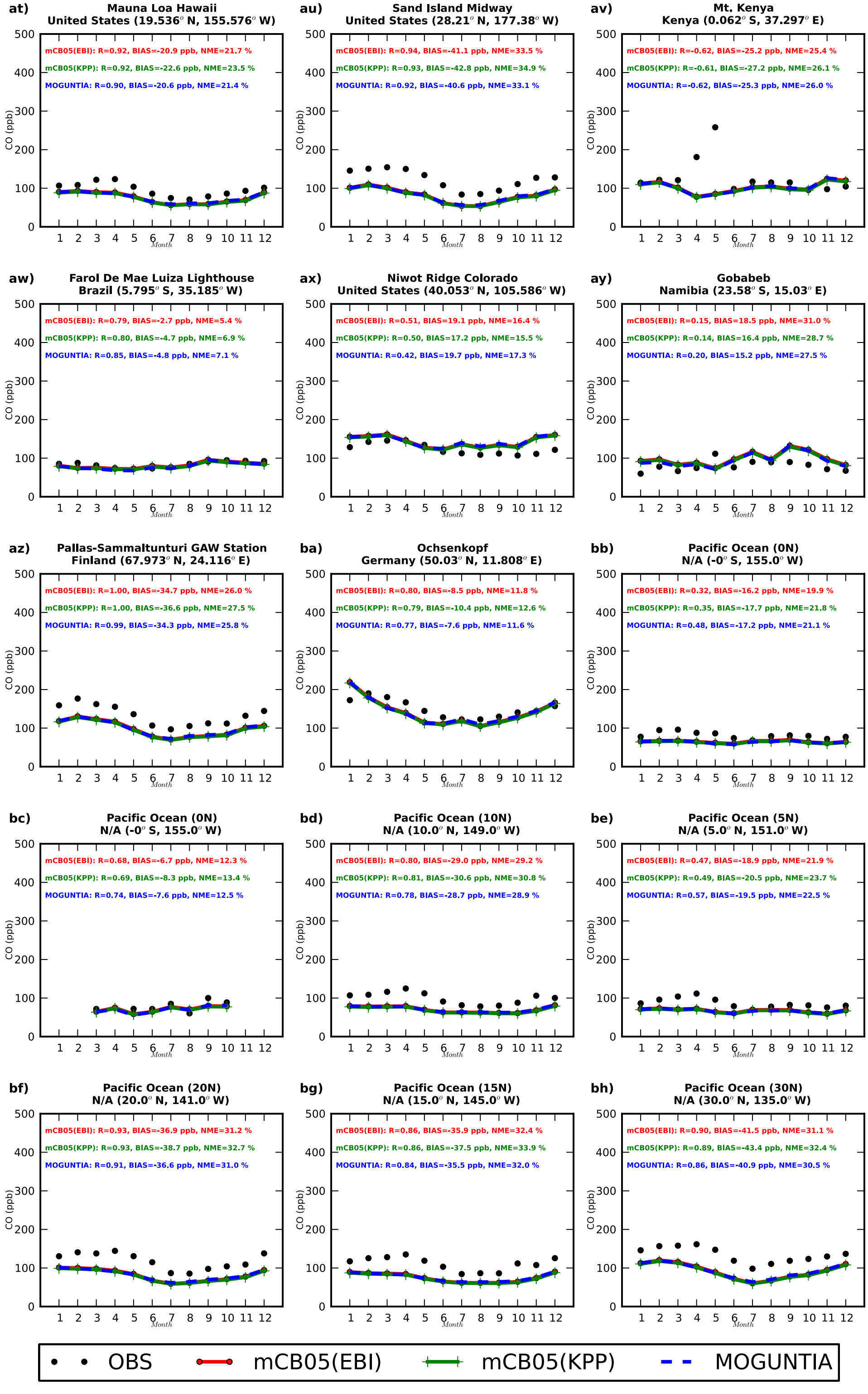
Figure S 3: Monthly mean comparisons of TM5-MP UTLS O_3 (top) and CO (bottom) mixing ratios (ppb) for the two chemistry schemes; mCB05(KPP) (blue line) and MOGUNTIA (red line), sampled at the measurement place and time against MOZAIC flight data (black line) between Frankfurt (50.0º N, 8.6º E) and Windhoek (22.5º S, 17.7º E) for April (left column) and October 2006 (right column). Data at pressures (P) lower than 300 hPa has been filtered out.

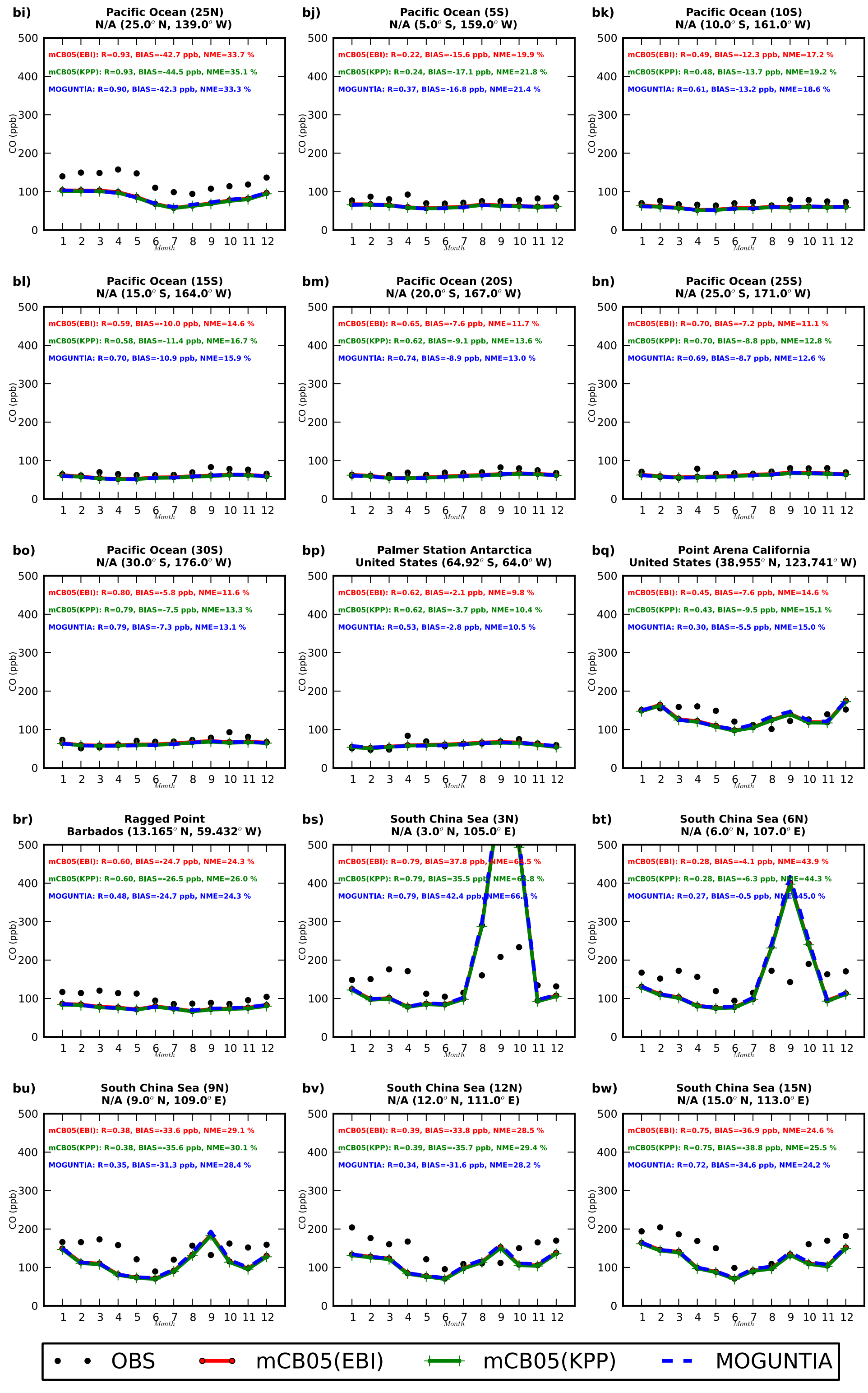


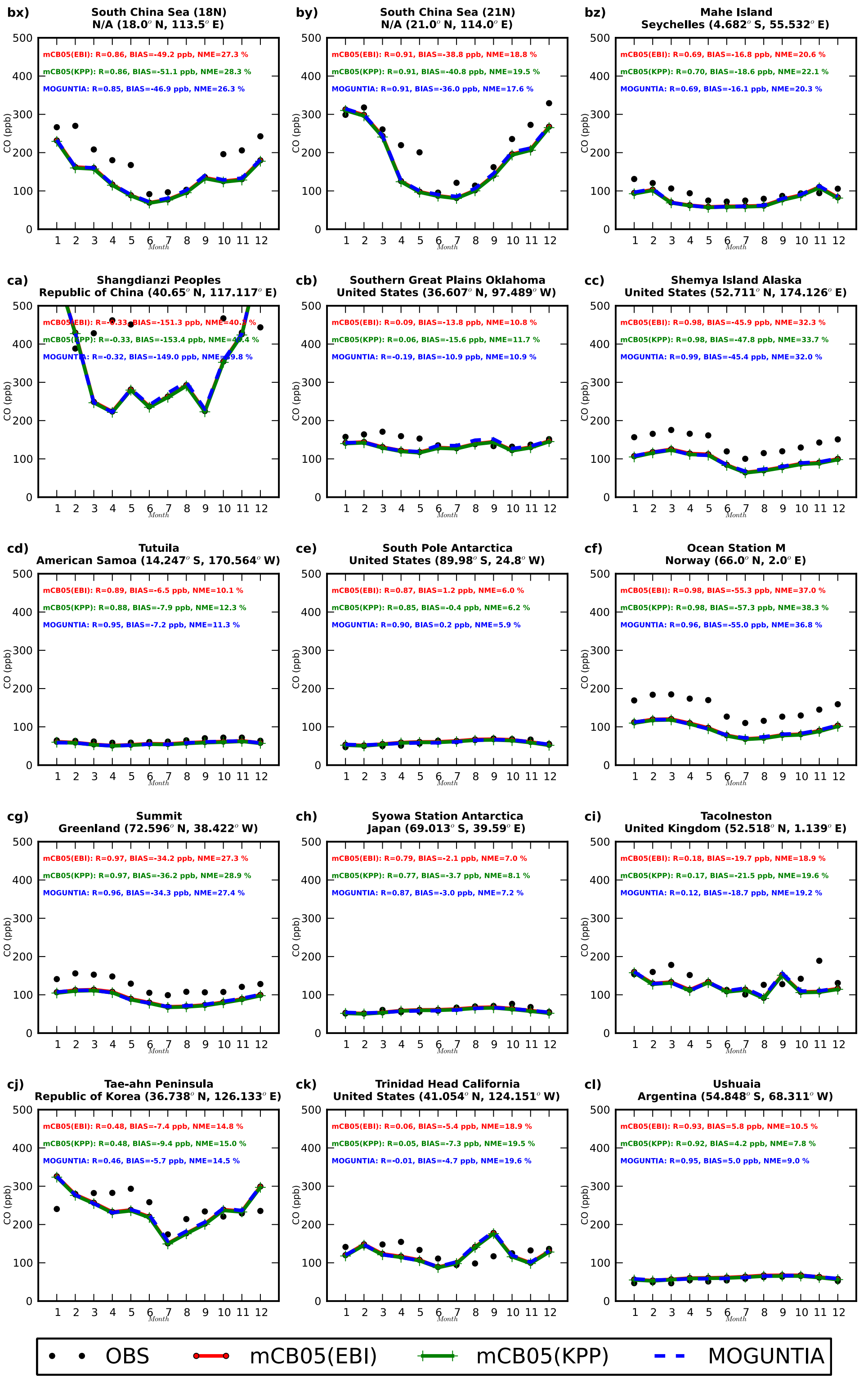
a) Alert Nunavut Canada (82.451° N, 62.507° W)
mCB05(EBI): R=1.00, BIAS=-42.5 ppb, NME=31.8 %
mCB05(KPP): R=1.00, BIAS=-44.4 ppb, NME=33.3 %
MOGUNTIA: R=0.99, BIAS=-42.6 ppb, NME=31.9 %
b) Arembepe Bahia Brazil (12.77° S, 38.17° W)
mCB05(EBI): R=0.82, BIAS=2.3 ppb, NME=6.0 %
mCB05(KPP): R=0.81, BIAS=0.5 ppb, NME=5.3 %
MOGUNTIA: R=0.82, BIAS=0.2 ppb, NME=5.8 %
c) Argyle Maine United States (45.035° N, 68.682° W)
mCB05(EBI): R=0.81, BIAS=-31.0 ppb, NME=20.3 %
mCB05(KPP): R=0.81, BIAS=-33.0 ppb, NME=21.5 %
MOGUNTIA: R=0.72, BIAS=-29.9 ppb, NME=19.5 %
d) Anmyeon-do Republic of Korea (36.539° N, 126.329° E)
mCB05(EBI): R=0.56, BIAS=-27.5 ppb, NME=16.8 %
mCB05(KPP): R=0.55, BIAS=-29.5 ppb, NME=17.3 %
MOGUNTIA: R=0.54, BIAS=-25.7 ppb, NME=16.3 %
e) Ascension Island United Kingdom (7.967° S, 14.4° W)
mCB05(EBI): R=0.87, BIAS=3.9 ppb, NME=8.0 %
mCB05(KPP): R=0.86, BIAS=1.7 ppb, NME=7.3 %
MOGUNTIA: R=0.89, BIAS=1.5 ppb, NME=7.5 %
f) Assekrem Algeria (23.262° N, 5.632° E)
mCB05(EBI): R=0.73, BIAS=-20.2 ppb, NME=19.4 %
mCB05(KPP): R=0.72, BIAS=-22.1 ppb, NME=21.2 %
MOGUNTIA: R=0.64, BIAS=-20.0 ppb, NME=19.2 %
g) Baltic Sea Poland (55.35° N, 17.22° E)
mCB05(EBI): R=0.93, BIAS=-63.4 ppb, NME=35.8 %
mCB05(KPP): R=0.93, BIAS=-65.3 ppb, NME=36.9 %
MOGUNTIA: R=0.92, BIAS=-62.6 ppb, NME=35.4 %
h) Terceira Island Azores Portugal (38.766° N, 27.375° W)
mCB05(EBI): R=0.89, BIAS=-44.8 ppb, NME=34.6 %
mCB05(KPP): R=0.89, BIAS=-46.6 ppb, NME=35.9 %
MOGUNTIA: R=0.86, BIAS=-44.5 ppb, NME=34.3 %
i) Bukit Kototabang Indonesia (0.202° S, 100.318° E)
mCB05(EBI): R=0.33, BIAS=106.8 ppb, NME=8
mCB05(KPP): R=0.33, BIAS=104. ppb, NME=8
MOGUNTIA: R=0.33, BIAS=114.7 ppb, NME=88.
j) Baring Head Station New Zealand (41.408° S, 174.871° E)
mCB05(EBI): R=0.89, BIAS=8.3 ppb, NME=14.7 %
mCB05(KPP): R=0.88, BIAS=6.7 ppb, NME=11.9 %
MOGUNTIA: R=0.90, BIAS=7.4 ppb, NME=13.0 %
k) St. Davids Head Bermuda United Kingdom (32.368° N, 64.648° W)
mCB05(EBI): R=0.91, BIAS=-47.0 ppb, NME=34.5 %
mCB05(KPP): R=0.91, BIAS=-48.8 ppb, NME=35.8 %
MOGUNTIA: R=0.89, BIAS=-46.4 ppb, NME=34.1 %
l) Tudor Hill Bermuda United Kingdom (32.265° N, 64.879° W)
mCB05(EBI): R=0.95, BIAS=-35.4 ppb, NME=28.3 %
mCB05(KPP): R=0.95, BIAS=-37.3 ppb, NME=29.8 %
MOGUNTIA: R=0.93, BIAS=-34.9 ppb, NME=27.9 %
m) Barrow Atmospheric Baseline Observatory United States (71.323° N, 156.611° W)
mCB05(EBI): R=0.96, BIAS=-30.2 ppb, NME=22.3 %
mCB05(KPP): R=0.96, BIAS=-32.2 ppb, NME=23.7 %
MOGUNTIA: R=0.96, BIAS=-30.0 ppb, NME=22.2 %
n) Black Sea Constanta Romania (44.178° N, 28.665° E)
mCB05(EBI): R=0.86, BIAS=-163.0 ppb, NME=56.6 %
mCB05(KPP): R=0.86, BIAS=-164.8 ppb, NME=57.2 %
MOGUNTIA: R=0.86, BIAS=-162.0 ppb, NME=56.2 %
o) Cold Bay Alaska United States (55.21° N, 162.72° W)
mCB05(EBI): R=0.97, BIAS=-46.9 ppb, NME=33.0 %
mCB05(KPP): R=0.97, BIAS=-48.8 ppb, NME=34.4 %
MOGUNTIA: R=0.96, BIAS=-46.5 ppb, NME=32.7 %
CO (ppb)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


p) Cape Grim Tasmania Australia (40.683° S, 144.69° E)
mCB05(EBI): R=0.08, BIAS=12.1 ppb, NME=20.6 %
mCB05(KPP): R=0.03, BIAS=10.5 ppb, NME=18.0 %
MOGUNTIA: R=0.03, BIAS=11.4 ppb, NME=19.5 %
q) Christmas Island Republic of Kiribati (1.7° N, 157.152° W)
mCB05(EBI): R=0.57, BIAS=-12.2 ppb, NME=15.9 %
mCB05(KPP): R=0.60, BIAS=-13.7 ppb, NME=17.9 %
MOGUNTIA: R=0.70, BIAS=-13.0 ppb, NME=16.9 %
r) Centro de Investigacion de la Baja Atmosfera (CIBA) Spain (41.81° N, 4.93° W)
mCB05(EBI): R=0.62, BIAS=-28.0 ppb, NME=21.9 %
mCB05(KPP): R=0.61, BIAS=-29.8 ppb, NME=23.2 %
MOGUNTIA: R=0.53, BIAS=-26.9 ppb, NME=21.0 %
s) Cape Point South Africa (34.352° S, 18.489° E)
mCB05(EBI): R=0.39, BIAS=54.3 ppb, NME=96.8 %
mCB05(KPP): R=0.37, BIAS=52.7 ppb, NME=93.9 %
MOGUNTIA: R=0.39, BIAS=53.3 ppb, NME=95.0 %
t) Cape Meares Oregon United States (45.478° N, 123.969° W)
mCB05(EBI): R=0.76, BIAS=-25.0 ppb, NME=19.3 %
mCB05(KPP): R=0.76, BIAS=-26.9 ppb, NME=20.3 %
MOGUNTIA: R=0.73, BIAS=-24.4 ppb, NME=19.0 %
u) Crozet Island France (46.434° S, 51.848° E)
mCB05(EBI): R=0.74, BIAS=-15.3 ppb, NME=19.8 %
mCB05(KPP): R=0.73, BIAS=-16.9 ppb, NME=21.9 %
MOGUNTIA: R=0.81, BIAS=-16.2 ppb, NME=20.9 %
v) Drake Passage N/A (59.0° S, 64.69° W)
mCB05(EBI): R=0.91, BIAS=6.6 ppb, NME=14.0 %
mCB05(KPP): R=0.90, BIAS=5.0 ppb, NME=13.0 %
MOGUNTIA: R=0.97, BIAS=5.8 ppb, NME=12.8 %
w) Easter Island Chile (27.16° S, 109.428° W)
mCB05(EBI): R=0.86, BIAS=-15.5 ppb, NME=20.3 %
mCB05(KPP): R=0.85, BIAS=-17.1 ppb, NME=22.3 %
MOGUNTIA: R=0.84, BIAS=-17.0 ppb, NME=22.2 %
x) Dongsha Island Taiwan (20.699° N, 116.73° E)
mCB05(EBI): R=0.90, BIAS=-59.0 ppb, NME=30.7 %
mCB05(KPP): R=0.90, BIAS=-60.9 ppb, NME=31.7 %
MOGUNTIA: R=0.89, BIAS=-56.6 ppb, NME=29.5 %
y) Mariana Islands Guam (13.386° N, 144.656° E)
mCB05(EBI): R=0.62, BIAS=-22.5 ppb, NME=26.7 %
mCB05(KPP): R=0.61, BIAS=-24.3 ppb, NME=28.1 %
MOGUNTIA: R=0.56, BIAS=-21.6 ppb, NME=26.5 %
z) Dwejra Point Gozo Malta (36.048° N, 14.889° E)
mCB05(EBI): R=0.78, BIAS=-68.5 ppb, NME=39.2 %
mCB05(KPP): R=0.77, BIAS=-70.3 ppb, NME=40.2 %
MOGUNTIA: R=0.67, BIAS=-66.7 ppb, NME=38.1 %
aa) Halley Station Antarctica United Kingdom (75.605° S, 26.21° W)
mCB05(EBI): R=0.88, BIAS=-12.1 ppb, NME=17.1 %
mCB05(KPP): R=0.86, BIAS=-13.7 ppb, NME=19.1 %
MOGUNTIA: R=0.93, BIAS=-12.9 ppb, NME=18.6 %
ab) Hohenpeissenberg Germany (47.801° N, 11.024° E)
mCB05(EBI): R=0.90, BIAS=-19.7 ppb, NME=13.7 %
mCB05(KPP): R=0.90, BIAS=-21.6 ppb, NME=14.7 %
MOGUNTIA: R=0.89, BIAS=-18.7 ppb, NME=13.1 %
ac) Hegyhatsal Hungary (46.95° N, 16.65° E)
mCB05(EBI): R=0.97, BIAS=-74.2 ppb, NME=33.9 %
mCB05(KPP): R=0.97, BIAS=-76.1 ppb, NME=34.7 %
MOGUNTIA: R=0.97, BIAS=-72.7 ppb, NME=33.2 %
ad) Humboldt State University United States (41.059° N, 124.75° W)
mCB05(EBI): R=0.26, BIAS=-7.1 ppb, NME=16.7 %
mCB05(KPP): R=0.24, BIAS=-9.0 ppb, NME=17.7 %
MOGUNTIA: R=0.13, BIAS=-6.1 ppb, NME=17.6 %
CO (ppb)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


ae) Storhofdi Vestmannaeyjar Iceland (63.4° N, 20.288° W)
mCB05(EBI): R=0.99, BIAS=-36.4 ppb, NME=28.4 %
mCB05(KPP): R=0.99, BIAS=-38.3 ppb, NME=29.9 %
MOGUNTIA: R=0.98, BIAS=-36.1 ppb, NME=28.2 %
af) Grifton North Carolina United States (35.365° N, 77.393° W)
mCB05(EBI): R=0.94, BIAS=-41.2 ppb, NME=22.2 %
mCB05(KPP): R=0.93, BIAS=-43.0 ppb, NME=23.1 %
MOGUNTIA: R=0.90, BIAS=-39.5 ppb, NME=21.2 %
ag) Cape Kumukahi Hawaii United States (19.737° N, 155.012° W)
mCB05(EBI): R=0.95, BIAS=-30.3 ppb, NME=28.7 %
mCB05(KPP): R=0.95, BIAS=-31.9 ppb, NME=30.3 %
MOGUNTIA: R=0.94, BIAS=-30.0 ppb, NME=28.4 %
ah) Izana Tenerife Canary Islands Spain (28.309° N, 16.499° W)
mCB05(EBI): R=0.84, BIAS=-20.5 ppb, NME=19.4 %
mCB05(KPP): R=0.84, BIAS=-22.3 ppb, NME=21.1 %
MOGUNTIA: R=0.77, BIAS=-19.7 ppb, NME=18.7 %
ai) Kaashidhoo Republic of Maldives (4.97° N, 73.47° E)
mCB05(EBI): R=0.81, BIAS=-23.1 ppb, NME=23.9 %
mCB05(KPP): R=0.81, BIAS=-24.9 ppb, NME=24.6 %
MOGUNTIA: R=0.80, BIAS=-20.7 ppb, NME=23.7 %
aj) Key Biscayne Florida United States (25.665° N, 80.158° W)
mCB05(EBI): R=0.89, BIAS=-55.4 ppb, NME=37.7 %
mCB05(KPP): R=0.88, BIAS=-57.1 ppb, NME=38.9 %
MOGUNTIA: R=0.88, BIAS=-54.5 ppb, NME=37.1 %
ak) Sary Taukumr Kazakhstan (44.084° N, 76.871° E)
mCB05(EBI): R=0.97, BIAS=-72.8 ppb, NME=40.5 %
mCB05(KPP): R=0.97, BIAS=-74.7 ppb, NME=41.6 %
MOGUNTIA: R=0.97, BIAS=-72.2 ppb, NME=40.2 %
al) Plateau Assy Kazakhstan (43.25° N, 77.88° E)
mCB05(EBI): R=0.41, BIAS=-27.4 ppb, NME=22.1 %
mCB05(KPP): R=0.40, BIAS=-29.4 ppb, NME=23.1 %
MOGUNTIA: R=0.36, BIAS=-26.6 ppb, NME=21.7 %
am) Park Falls Wisconsin United States (45.945° N, 90.273° W)
mCB05(EBI): R=0.59, BIAS=-3.9 ppb, NME=7.8 %
mCB05(KPP): R=0.58, BIAS=-5.8 ppb, NME=7.9 %
MOGUNTIA: R=0.47, BIAS=-2.9 ppb, NME=8.8 %
an) Lac La Biche Alberta Canada (54.954° N, 112.467° W)
mCB05(EBI): R=0.61, BIAS=-39.6 ppb, NME=29.1 %
mCB05(KPP): R=0.60, BIAS=-41.5 ppb, NME=30.2 %
MOGUNTIA: R=0.56, BIAS=-39.2 ppb, NME=29.2 %
ao) Lulin Taiwan (23.47° N, 120.87° E)
mCB05(EBI): R=0.55, BIAS=48.5 ppb, NME=37.7 %
mCB05(KPP): R=0.55, BIAS=46.6 ppb, NME=36.7 %
MOGUNTIA: R=0.54, BIAS=51.1 ppb, NME=39.3 %
ap) Lampedusa Italy (35.52° N, 12.62° E)
mCB05(EBI): R=0.81, BIAS=-30.6 ppb, NME=23.5 %
mCB05(KPP): R=0.80, BIAS=-32.5 ppb, NME=25.0 %
MOGUNTIA: R=0.72, BIAS=-29.0 ppb, NME=22.3 %
aq) Mould Bay Northwest Territories Canada (76.247° N, 119.353° W)
mCB05(EBI): R=0.98, BIAS=-59.8 ppb, NME=39.5 %
mCB05(KPP): R=0.98, BIAS=-61.7 ppb, NME=40.8 %
MOGUNTIA: R=0.98, BIAS=-59.8 ppb, NME=39.5 %
ar) Mace Head County Galway Ireland (53.326° N, 9.899° W)
mCB05(EBI): R=0.92, BIAS=-35.8 ppb, NME=26.7 %
mCB05(KPP): R=0.92, BIAS=-37.6 ppb, NME=28.1 %
MOGUNTIA: R=0.90, BIAS=-35.3 ppb, NME=26.3 %
as) High Altitude Global Climate Observation Center Mexico (18.984° N, 97.311° W)
mCB05(EBI): R=0.87, BIAS=12.9 ppb, NME=13.9 %
mCB05(KPP): R=0.87, BIAS=11.1 ppb, NME=12.5 %
MOGUNTIA: R=0.87, BIAS=15.8 ppb, NME=16.0 %
CO (ppb)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


at)
Mauna Loa Hawaii
United States (19.536° N, 155.576° W)
mCB05(EBI): R=0.92, BIAS=-20.9 ppb, NME=21.7 %
mCB05(KPP): R=0.92, BIAS=-22.6 ppb, NME=23.5 %
MOGUNTIA: R=0.90, BIAS=-20.6 ppb, NME=21.4 %
au)
Sand Island Midway
United States (28.21° N, 177.38° W)
mCB05(EBI): R=0.94, BIAS=-41.1 ppb, NME=33.5 %
mCB05(KPP): R=0.93, BIAS=-42.8 ppb, NME=34.9 %
MOGUNTIA: R=0.92, BIAS=-40.6 ppb, NME=33.1 %
av)
Mt. Kenya
Kenya (0.062° S, 37.297° E)
mCB05(EBI): R=-0.62, BIAS=-25.2 ppb, NME=25.4 %
mCB05(KPP): R=-0.61, BIAS=-27.2 ppb, NME=26.1 %
MOGUNTIA: R=-0.62, BIAS=-25.3 ppb, NME=26.0 %
aw)
Farol De Mae Luiza Lighthouse
Brazil (5.795° S, 35.185° W)
mCB05(EBI): R=0.79, BIAS=-2.7 ppb, NME=5.4 %
mCB05(KPP): R=0.80, BIAS=-4.7 ppb, NME=6.9 %
MOGUNTIA: R=0.85, BIAS=-4.8 ppb, NME=7.1 %
ax)
Niwot Ridge Colorado
United States (40.053° N, 105.586° W)
mCB05(EBI): R=0.51, BIAS=19.1 ppb, NME=16.4 %
mCB05(KPP): R=0.50, BIAS=17.2 ppb, NME=15.5 %
MOGUNTIA: R=0.42, BIAS=19.7 ppb, NME=17.3 %
ay)
Gobabeb
Namibia (23.58° S, 15.03° E)
mCB05(EBI): R=0.15, BIAS=18.5 ppb, NME=31.0 %
mCB05(KPP): R=0.14, BIAS=16.4 ppb, NME=28.7 %
MOGUNTIA: R=0.20, BIAS=15.2 ppb, NME=27.5 %
az)
Pallas-Sammaltunturi GAW Station
Finland (67.973° N, 24.116° E)
mCB05(EBI): R=1.00, BIAS=-34.7 ppb, NME=26.0 %
mCB05(KPP): R=1.00, BIAS=-36.6 ppb, NME=27.5 %
MOGUNTIA: R=0.99, BIAS=-34.3 ppb, NME=25.8 %
ba)
Ochsenkopf
Germany (50.03° N, 11.808° E)
mCB05(EBI): R=0.80, BIAS=-8.5 ppb, NME=11.8 %
mCB05(KPP): R=0.79, BIAS=-10.4 ppb, NME=12.6 %
MOGUNTIA: R=0.77, BIAS=-7.6 ppb, NME=11.6 %
bb)
Pacific Ocean (0N)
N/A (-0° S, 155.0° W)
mCB05(EBI): R=0.32, BIAS=-16.2 ppb, NME=19.9 %
mCB05(KPP): R=0.35, BIAS=-17.7 ppb, NME=21.8 %
MOGUNTIA: R=0.48, BIAS=-17.2 ppb, NME=21.1 %
bc)
Pacific Ocean (0N)
N/A (-0° S, 155.0° W)
mCB05(EBI): R=0.68, BIAS=-6.7 ppb, NME=12.3 %
mCB05(KPP): R=0.69, BIAS=-8.3 ppb, NME=13.4 %
MOGUNTIA: R=0.74, BIAS=-7.6 ppb, NME=12.5 %
bd)
Pacific Ocean (10N)
N/A (10.0° N, 149.0° W)
mCB05(EBI): R=0.80, BIAS=-29.0 ppb, NME=29.2 %
mCB05(KPP): R=0.81, BIAS=-30.6 ppb, NME=30.8 %
MOGUNTIA: R=0.78, BIAS=-28.7 ppb, NME=28.9 %
be)
Pacific Ocean (5N)
N/A (5.0° N, 151.0° W)
mCB05(EBI): R=0.47, BIAS=-18.9 ppb, NME=21.9 %
mCB05(KPP): R=0.49, BIAS=-20.5 ppb, NME=23.7 %
MOGUNTIA: R=0.57, BIAS=-19.5 ppb, NME=22.5 %
bf)
Pacific Ocean (20N)
N/A (20.0° N, 141.0° W)
mCB05(EBI): R=0.93, BIAS=-36.9 ppb, NME=31.2 %
mCB05(KPP): R=0.93, BIAS=-38.7 ppb, NME=32.7 %
MOGUNTIA: R=0.91, BIAS=-36.6 ppb, NME=31.0 %
bg)
Pacific Ocean (15N)
N/A (15.0° N, 145.0° W)
mCB05(EBI): R=0.86, BIAS=-35.9 ppb, NME=32.4 %
mCB05(KPP): R=0.86, BIAS=-37.5 ppb, NME=33.9 %
MOGUNTIA: R=0.84, BIAS=-35.5 ppb, NME=32.0 %
bh)
Pacific Ocean (30N)
N/A (30.0° N, 135.0° W)
mCB05(EBI): R=0.90, BIAS=-41.5 ppb, NME=31.1 %
mCB05(KPP): R=0.89, BIAS=-43.4 ppb, NME=32.4 %
MOGUNTIA: R=0.86, BIAS=-40.9 ppb, NME=30.5 %
CO (ppb)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


bi)
Pacific Ocean (25N)
N/A (25.0° N, 139.0° W)
mCB05(EBI): R=0.93, BIAS=-42.7 ppb, NME=33.7 %
mCB05(KPP): R=0.93, BIAS=-44.5 ppb, NME=35.1 %
MOGUNTIA: R=0.90, BIAS=-42.3 ppb, NME=33.3 %
bj)
Pacific Ocean (5S)
N/A (5.0° S, 159.0° W)
mCB05(EBI): R=0.22, BIAS=-15.6 ppb, NME=19.9 %
mCB05(KPP): R=0.24, BIAS=-17.1 ppb, NME=21.8 %
MOGUNTIA: R=0.37, BIAS=-16.8 ppb, NME=21.4 %
bk)
Pacific Ocean (10S)
N/A (10.0° S, 161.0° W)
mCB05(EBI): R=0.49, BIAS=-12.3 ppb, NME=17.2 %
mCB05(KPP): R=0.48, BIAS=-13.7 ppb, NME=19.2 %
MOGUNTIA: R=0.61, BIAS=-13.2 ppb, NME=18.6 %
bl)
Pacific Ocean (15S)
N/A (15.0° S, 164.0° W)
mCB05(EBI): R=0.59, BIAS=-10.0 ppb, NME=14.6 %
mCB05(KPP): R=0.58, BIAS=-11.4 ppb, NME=16.7 %
MOGUNTIA: R=0.70, BIAS=-10.9 ppb, NME=15.9 %
bm)
Pacific Ocean (20S)
N/A (20.0° S, 167.0° W)
mCB05(EBI): R=0.65, BIAS=-7.6 ppb, NME=11.7 %
mCB05(KPP): R=0.62, BIAS=-9.1 ppb, NME=13.6 %
MOGUNTIA: R=0.74, BIAS=-8.9 ppb, NME=13.0 %
bn)
Pacific Ocean (25S)
N/A (25.0° S, 171.0° W)
mCB05(EBI): R=0.70, BIAS=-7.2 ppb, NME=11.1 %
mCB05(KPP): R=0.70, BIAS=-8.8 ppb, NME=12.8 %
MOGUNTIA: R=0.69, BIAS=-8.7 ppb, NME=12.6 %
bo)
Pacific Ocean (30S)
N/A (30.0° S, 176.0° W)
mCB05(EBI): R=0.80, BIAS=-5.8 ppb, NME=11.6 %
mCB05(KPP): R=0.79, BIAS=-7.5 ppb, NME=13.3 %
MOGUNTIA: R=0.79, BIAS=-7.3 ppb, NME=13.1 %
bp)
Palmer Station Antarctica
United States (64.92° S, 64.0° W)
mCB05(EBI): R=0.62, BIAS=-2.1 ppb, NME=9.8 %
mCB05(KPP): R=0.62, BIAS=-3.7 ppb, NME=10.4 %
MOGUNTIA: R=0.53, BIAS=-2.8 ppb, NME=10.5 %
bq)
Point Arena California
United States (38.955° N, 123.741° W)
mCB05(EBI): R=0.45, BIAS=-7.6 ppb, NME=14.6 %
mCB05(KPP): R=0.43, BIAS=-9.5 ppb, NME=15.1 %
MOGUNTIA: R=0.30, BIAS=-5.5 ppb, NME=15.0 %
br)
Ragged Point
Barbados (13.165° N, 59.432° W)
mCB05(EBI): R=0.60, BIAS=-24.7 ppb, NME=24.3 %
mCB05(KPP): R=0.60, BIAS=-26.5 ppb, NME=26.0 %
MOGUNTIA: R=0.48, BIAS=-24.7 ppb, NME=24.3 %
bs)
South China Sea (3N)
N/A (3.0° N, 105.0° E)
mCB05(EBI): R=0.79, BIAS=37.8 ppb, NME=
mCB05(KPP): R=0.79, BIAS=35.5 ppb, NME=
MOGUNTIA: R=0.79, BIAS=42.4 ppb, NME=
bt)
South China Sea (6N)
N/A (6.0° N, 107.0° E)
mCB05(EBI): R=0.28, BIAS=-4.1 ppb, NME=43.9 %
mCB05(KPP): R=0.28, BIAS=-6.3 ppb, NME=44.3 %
MOGUNTIA: R=0.27, BIAS=-0.5 ppb, N
bu)
South China Sea (9N)
N/A (9.0° N, 109.0° E)
mCB05(EBI): R=0.38, BIAS=-33.6 ppb, NME=29.1 %
mCB05(KPP): R=0.38, BIAS=-35.6 ppb, NME=30.1 %
MOGUNTIA: R=0.35, BIAS=-31.3 ppb, NME=28.4 %
bv)
South China Sea (12N)
N/A (12.0° N, 111.0° E)
mCB05(EBI): R=0.39, BIAS=-33.8 ppb, NME=28.5 %
mCB05(KPP): R=0.39, BIAS=-35.7 ppb, NME=29.4 %
MOGUNTIA: R=0.34, BIAS=-31.6 ppb, NME=28.2 %
bw)
South China Sea (15N)
N/A (15.0° N, 113.0° E)
mCB05(EBI): R=0.75, BIAS=-36.9 ppb, NME=24.6 %
mCB05(KPP): R=0.75, BIAS=-38.8 ppb, NME=25.5 %
MOGUNTIA: R=0.72, BIAS=-34.6 ppb, NME=24.2 %
CO (ppb)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


bx)
South China Sea (18N)
N/A (18.0° N, 113.5° E)
mCB05(EBI): R=0.86, BIAS=-49.2 ppb, NME=27.3 %
mCB05(KPP): R=0.86, BIAS=-51.1 ppb, NME=28.3 %
MOGUNTIA: R=0.85, BIAS=-46.9 ppb, NME=26.3 %
by)
South China Sea (21N)
N/A (21.0° N, 114.0° E)
mCB05(EBI): R=0.91, BIAS=-38.8 ppb, NME=18.8 %
mCB05(KPP): R=0.91, BIAS=-40.8 ppb, NME=19.5 %
MOGUNTIA: R=0.91, BIAS=-36.0 ppb, NME=17.6 %
bz)
Mahe Island
Seychelles (4.682° S, 55.532° E)
mCB05(EBI): R=0.69, BIAS=-16.8 ppb, NME=20.6 %
mCB05(KPP): R=0.70, BIAS=-18.6 ppb, NME=22.1 %
MOGUNTIA: R=0.69, BIAS=-16.1 ppb, NME=20.3 %
ca)
Shangdianzi Peoples
Republic of China (40.65° N, 117.117° E)
BIAS=-151.3 ppb
R=-0.33, BIAS=-153.4 ppb
R=-0.32, BIAS=-149.0 ppb
cb)
Southern Great Plains Oklahoma
United States (36.607° N, 97.489° W)
mCB05(EBI): R=0.09, BIAS=-13.8 ppb, NME=10.8 %
mCB05(KPP): R=0.06, BIAS=-15.6 ppb, NME=11.7 %
MOGUNTIA: R=-0.19, BIAS=-10.9 ppb, NME=10.9 %
cc)
Shemya Island Alaska
United States (52.711° N, 174.126° E)
mCB05(EBI): R=0.98, BIAS=-45.9 ppb, NME=32.3 %
mCB05(KPP): R=0.98, BIAS=-47.8 ppb, NME=33.7 %
MOGUNTIA: R=0.99, BIAS=-45.4 ppb, NME=32.0 %
cd)
Tutuila
American Samoa (14.247° S, 170.564° W)
mCB05(EBI): R=0.89, BIAS=-6.5 ppb, NME=10.1 %
mCB05(KPP): R=0.88, BIAS=-7.9 ppb, NME=12.3 %
MOGUNTIA: R=0.95, BIAS=-7.2 ppb, NME=11.3 %
ce)
South Pole Antarctica
United States (89.98° S, 24.8° W)
mCB05(EBI): R=0.87, BIAS=1.2 ppb, NME=6.0 %
mCB05(KPP): R=0.85, BIAS=-0.4 ppb, NME=6.2 %
MOGUNTIA: R=0.90, BIAS=0.2 ppb, NME=5.9 %
cf)
Ocean Station M
Norway (66.0° N, 2.0° E)
mCB05(EBI): R=0.98, BIAS=-55.3 ppb, NME=37.0 %
mCB05(KPP): R=0.98, BIAS=-57.3 ppb, NME=38.3 %
MOGUNTIA: R=0.96, BIAS=-55.0 ppb, NME=36.8 %
cg)
Summit
Greenland (72.596° N, 38.422° W)
mCB05(EBI): R=0.97, BIAS=-34.2 ppb, NME=27.3 %
mCB05(KPP): R=0.97, BIAS=-36.2 ppb, NME=28.9 %
MOGUNTIA: R=0.96, BIAS=-34.3 ppb, NME=27.4 %
ch)
Syowa Station Antarctica
Japan (69.013° S, 39.59° E)
mCB05(EBI): R=0.79, BIAS=-2.1 ppb, NME=7.0 %
mCB05(KPP): R=0.77, BIAS=-3.7 ppb, NME=8.1 %
MOGUNTIA: R=0.87, BIAS=-3.0 ppb, NME=7.2 %
ci)
Tacolneston
United Kingdom (52.518° N, 1.139° E)
mCB05(EBI): R=0.18, BIAS=-19.7 ppb, NME=18.9 %
mCB05(KPP): R=0.17, BIAS=-21.5 ppb, NME=19.6 %
MOGUNTIA: R=0.12, BIAS=-18.7 ppb, NME=19.2 %
cj)
Tae-ahn Peninsula
Republic of Korea (36.738° N, 126.133° E)
mCB05(EBI): R=0.48, BIAS=-7.4 ppb, NME=14.8 %
mCB05(KPP): R=0.48, BIAS=-9.4 ppb, NME=15.0 %
MOGUNTIA: R=0.46, BIAS=-5.7 ppb, NME=14.5 %
ck)
Trinidad Head California
United States (41.054° N, 124.151° W)
mCB05(EBI): R=0.06, BIAS=-5.4 ppb, NME=18.9 %
mCB05(KPP): R=0.05, BIAS=-7.3 ppb, NME=19.5 %
MOGUNTIA: R=-0.01, BIAS=-4.7 ppb, NME=19.6 %
cl)
Ushuaia
Argentina (54.848° S, 68.311° W)
mCB05(EBI): R=0.93, BIAS=5.8 ppb, NME=10.5 %
mCB05(KPP): R=0.92, BIAS=4.2 ppb, NME=7.8 %
MOGUNTIA: R=0.95, BIAS=5.0 ppb, NME=9.0 %
CO (ppb)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

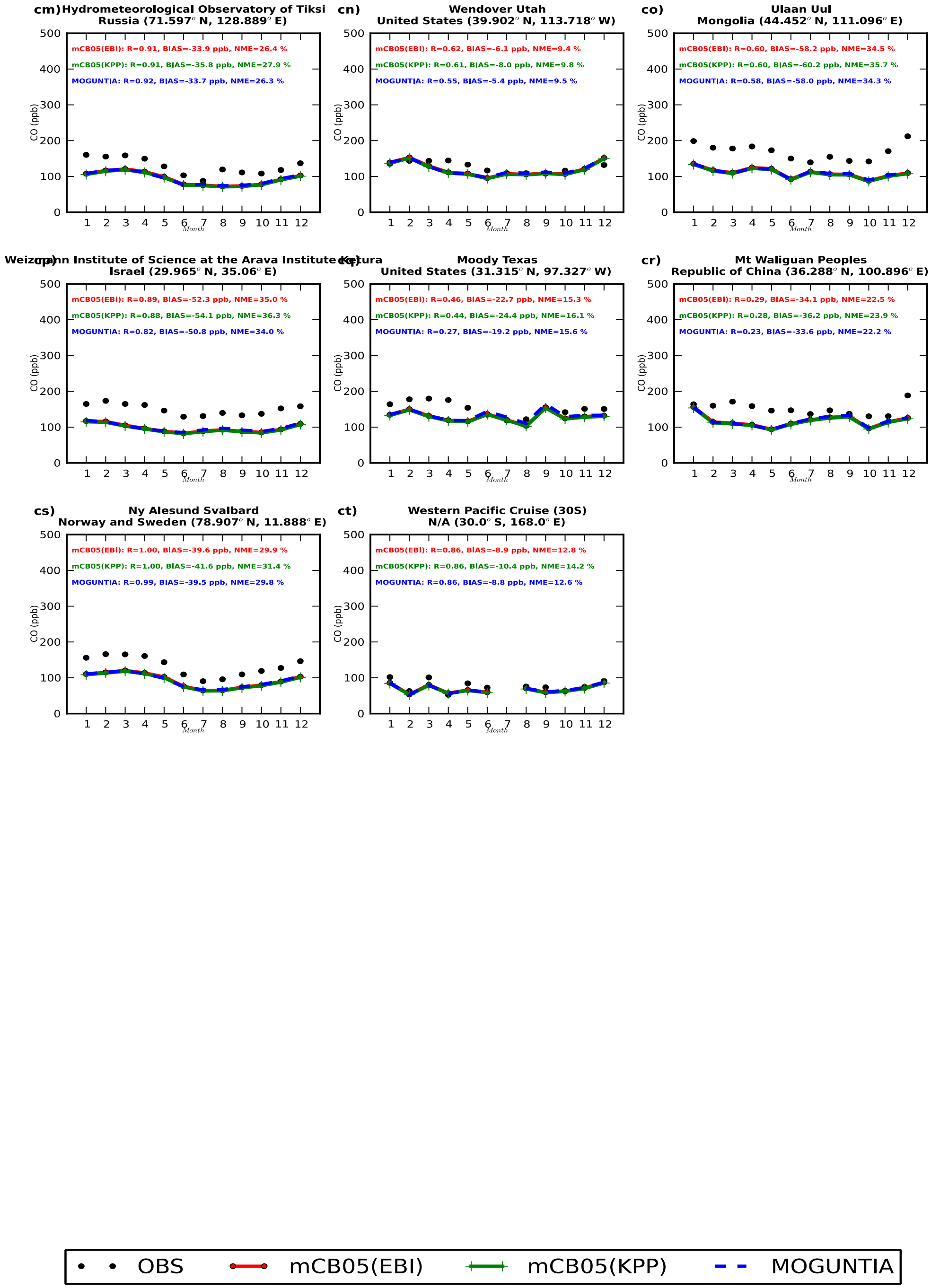
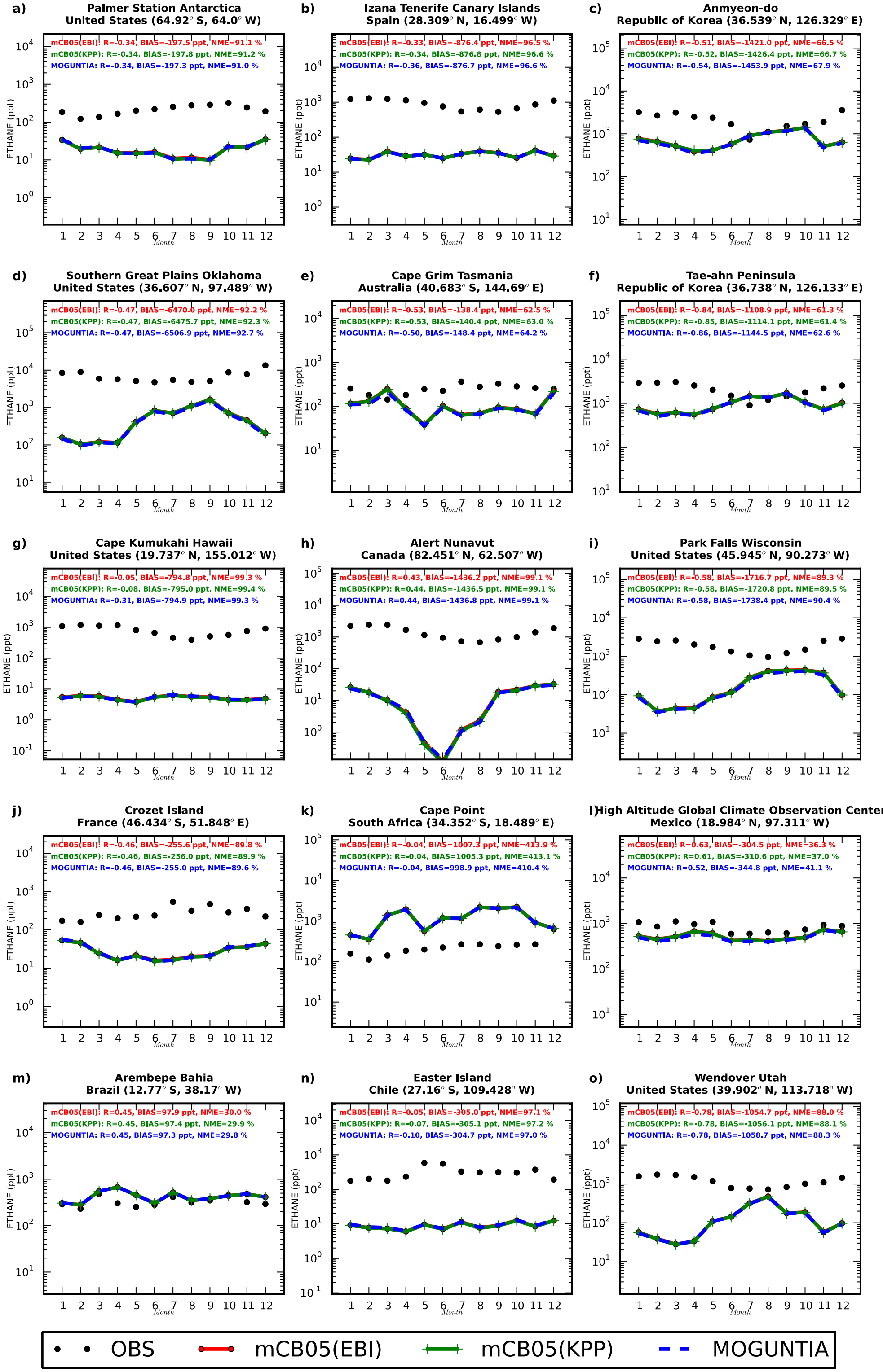
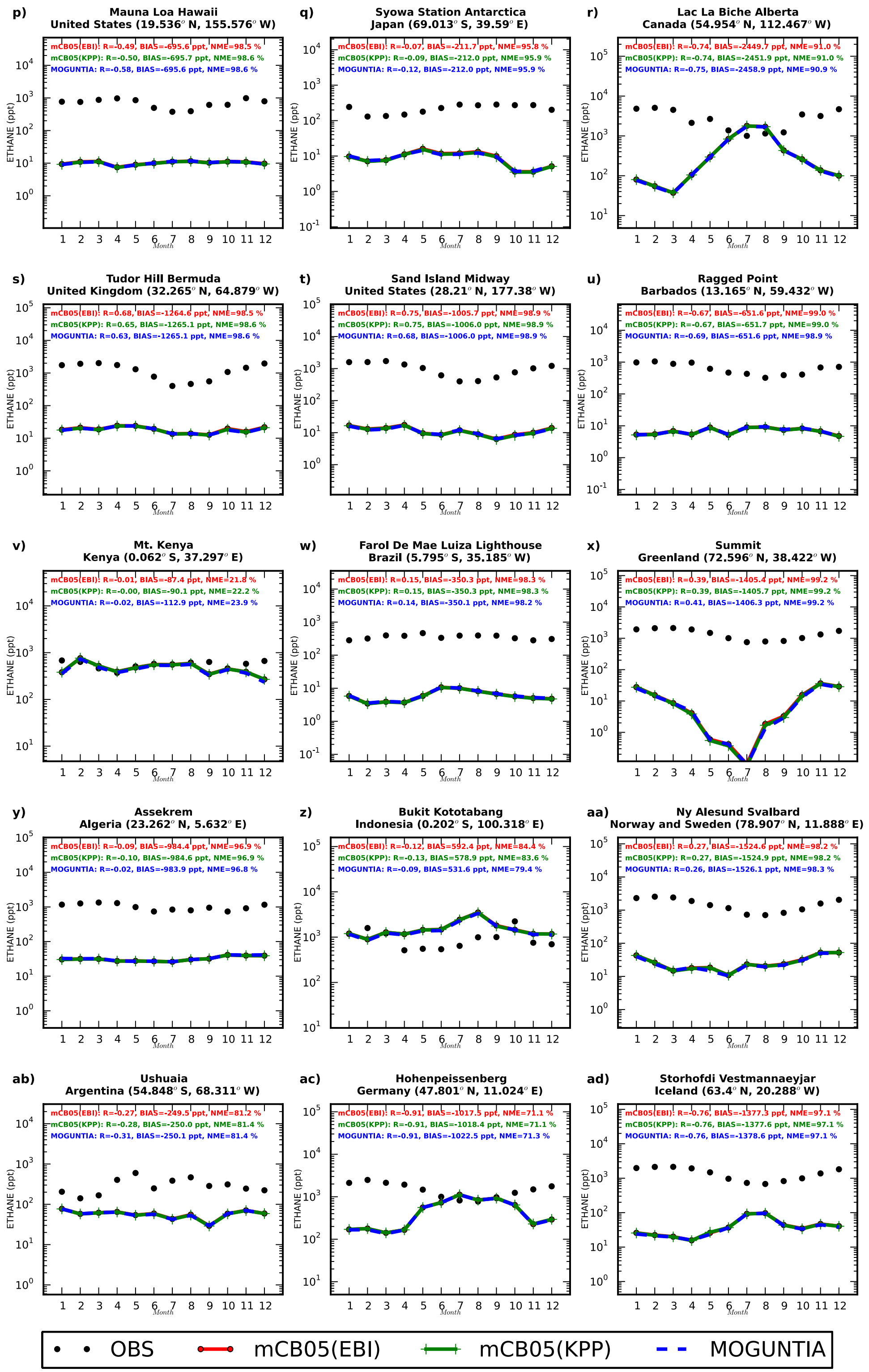


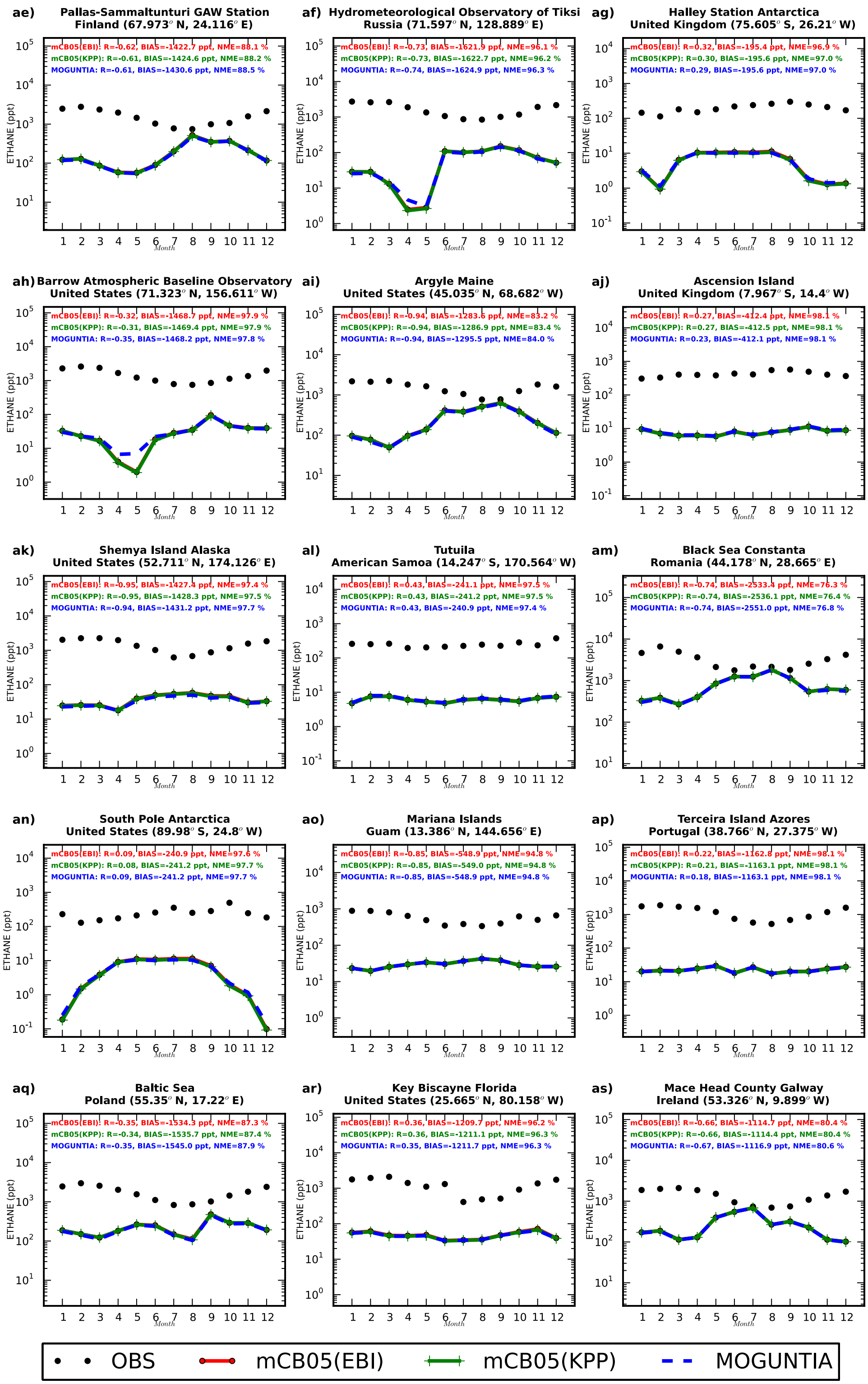
Figure S 4: Comparison of monthly mean surface CO flask measurements (black dots) in ppb with model results (red-line for mCB05(EBI), green-line for mCB05(KPP) and blue-line for MOGUNTIA) at various stations around the globe, as obtained from NOAA database, for the year 2006.



a)
Palmer Station Antarctica
United States (64.92° S, 64.0° W)
mCB05(EBI): R=-0.34, BIAS=-197.5 ppt, NME=91.1 %
mCB05(KPP): R=-0.34, BIAS=-197.8 ppt, NME=91.2 %
MOGUNTIA: R=-0.34, BIAS=-197.3 ppt, NME=91.0 %
b)
Izana Tenerife Canary Islands
Spain (28.309° N, 16.499° W)
mCB05(EBI): R=-0.33, BIAS=-876.4 ppt, NME=96.5 %
mCB05(KPP): R=-0.34, BIAS=-876.8 ppt, NME=96.6 %
MOGUNTIA: R=-0.36, BIAS=-876.7 ppt, NME=96.6 %
c)
Anmyeon-do
Republic of Korea (36.539° N, 126.329° E)
mCB05(EBI): R=-0.51, BIAS=-1421.0 ppt, NME=66.5 %
mCB05(KPP): R=-0.52, BIAS=-1426.4 ppt, NME=66.7 %
MOGUNTIA: R=-0.54, BIAS=-1453.9 ppt, NME=67.9 %
d)
Southern Great Plains Oklahoma
United States (36.607° N, 97.489° W)
mCB05(EBI): R=-0.47, BIAS=-6470.0 ppt, NME=92.2 %
mCB05(KPP): R=-0.47, BIAS=-6475.7 ppt, NME=92.3 %
MOGUNTIA: R=-0.47, BIAS=-6506.9 ppt, NME=92.7 %
e)
Cape Grim Tasmania
Australia (40.683° S, 144.69° E)
mCB05(EBI): R=-0.53, BIAS=-138.4 ppt, NME=62.5 %
mCB05(KPP): R=-0.53, BIAS=-140.4 ppt, NME=63.0 %
MOGUNTIA: R=-0.50, BIAS=-148.4 ppt, NME=64.2 %
f)
Tae-ahn Peninsula
Republic of Korea (36.738° N, 126.133° E)
mCB05(EBI): R=-0.84, BIAS=-1108.9 ppt, NME=61.3 %
mCB05(KPP): R=-0.85, BIAS=-1114.1 ppt, NME=61.4 %
MOGUNTIA: R=-0.86, BIAS=-1144.5 ppt, NME=62.6 %
g)
Cape Kumukahi Hawaii
United States (19.737° N, 155.012° W)
mCB05(EBI): R=-0.05, BIAS=-794.8 ppt, NME=99.3 %
mCB05(KPP): R=-0.08, BIAS=-795.0 ppt, NME=99.4 %
MOGUNTIA: R=-0.31, BIAS=-794.9 ppt, NME=99.3 %
h)
Alert Nunavut
Canada (82.451° N, 62.507° W)
mCB05(EBI): R=0.43, BIAS=-1436.2 ppt, NME=99.1 %
mCB05(KPP): R=0.44, BIAS=-1436.5 ppt, NME=99.1 %
MOGUNTIA: R=0.44, BIAS=-1436.8 ppt, NME=99.1 %
i)
Park Falls Wisconsin
United States (45.945° N, 90.273° W)
mCB05(EBI): R=-0.58, BIAS=-1716.7 ppt, NME=89.3 %
mCB05(KPP): R=-0.58, BIAS=-1720.8 ppt, NME=89.5 %
MOGUNTIA: R=-0.58, BIAS=-1738.4 ppt, NME=90.4 %
j)
Crozet Island
France (46.434° S, 51.848° E)
mCB05(EBI): R=-0.46, BIAS=-255.6 ppt, NME=89.8 %
mCB05(KPP): R=-0.46, BIAS=-256.0 ppt, NME=89.9 %
MOGUNTIA: R=-0.46, BIAS=-255.0 ppt, NME=89.6 %
k)
Cape Point
South Africa (34.352° S, 18.489° E)
mCB05(EBI): R=-0.04, BIAS=1007.3 ppt, NME=413.9 %
mCB05(KPP): R=-0.04, BIAS=1005.3 ppt, NME=413.1 %
MOGUNTIA: R=-0.04, BIAS=998.9 ppt, NME=410.4 %
l)
High Altitude Global Climate Observation Center
Mexico (18.984° N, 97.311° W)
mCB05(EBI): R=0.63, BIAS=-304.5 ppt, NME=36.3 %
mCB05(KPP): R=0.61, BIAS=-310.6 ppt, NME=37.0 %
MOGUNTIA: R=0.52, BIAS=-344.8 ppt, NME=41.1 %
m)
Arembepe Bahia
Brazil (12.77° S, 38.17° W)
mCB05(EBI): R=0.45, BIAS=97.9 ppt, NME=30.0 %
mCB05(KPP): R=0.45, BIAS=97.4 ppt, NME=29.9 %
MOGUNTIA: R=0.45, BIAS=97.3 ppt, NME=29.8 %
n)
Easter Island
Chile (27.16° S, 109.428° W)
mCB05(EBI): R=-0.05, BIAS=-305.0 ppt, NME=97.1 %
mCB05(KPP): R=-0.07, BIAS=-305.1 ppt, NME=97.2 %
MOGUNTIA: R=-0.10, BIAS=-304.7 ppt, NME=97.0 %
o)
Wendover Utah
United States (39.902° N, 113.718° W)
mCB05(EBI): R=-0.78, BIAS=-1054.7 ppt, NME=88.0 %
mCB05(KPP): R=-0.78, BIAS=-1056.1 ppt, NME=88.1 %
MOGUNTIA: R=-0.78, BIAS=-1058.7 ppt, NME=88.3 %
ETHANE (ppt)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA



p)
Mauna Loa Hawaii
United States (19.536° N, 155.576° W)
mCB05(EBI): R=-0.49, BIAS=-695.6 ppt, NME=98.5 %
mCB05(KPP): R=-0.50, BIAS=-695.7 ppt, NME=98.6 %
MOGUNTIA: R=-0.58, BIAS=-695.6 ppt, NME=98.6 %
q)
Syowa Station Antarctica
Japan (69.013° S, 39.59° E)
mCB05(EBI): R=-0.07, BIAS=-211.7 ppt, NME=95.8 %
mCB05(KPP): R=-0.09, BIAS=-212.0 ppt, NME=95.9 %
MOGUNTIA: R=-0.12, BIAS=-212.0 ppt, NME=95.9 %
r)
Lac La Biche Alberta
Canada (54.954° N, 112.467° W)
mCB05(EBI): R=-0.74, BIAS=-2449.7 ppt, NME=91.0 %
mCB05(KPP): R=-0.74, BIAS=-2451.9 ppt, NME=91.0 %
MOGUNTIA: R=-0.75, BIAS=-2458.9 ppt, NME=90.9 %
s)
Tudor Hill Bermuda
United Kingdom (32.265° N, 64.879° W)
mCB05(EBI): R=0.68, BIAS=-1264.6 ppt, NME=98.5 %
mCB05(KPP): R=0.65, BIAS=-1265.1 ppt, NME=98.6 %
MOGUNTIA: R=0.63, BIAS=-1265.1 ppt, NME=98.6 %
t)
Sand Island Midway
United States (28.21° N, 177.38° W)
mCB05(EBI): R=0.75, BIAS=-1005.7 ppt, NME=98.9 %
mCB05(KPP): R=0.75, BIAS=-1006.0 ppt, NME=98.9 %
MOGUNTIA: R=0.68, BIAS=-1006.0 ppt, NME=98.9 %
u)
Ragged Point
Barbados (13.165° N, 59.432° W)
mCB05(EBI): R=-0.67, BIAS=-651.6 ppt, NME=99.0 %
mCB05(KPP): R=-0.67, BIAS=-651.7 ppt, NME=99.0 %
MOGUNTIA: R=-0.69, BIAS=-651.6 ppt, NME=98.9 %
v)
Mt. Kenya
Kenya (0.062° S, 37.297° E)
mCB05(EBI): R=-0.01, BIAS=-87.4 ppt, NME=21.8 %
mCB05(KPP): R=-0.00, BIAS=-90.1 ppt, NME=22.2 %
MOGUNTIA: R=-0.02, BIAS=-112.9 ppt, NME=23.9 %
w)
Farol De Mae Luiza Lighthouse
Brazil (5.795° S, 35.185° W)
mCB05(EBI): R=0.15, BIAS=-350.3 ppt, NME=98.3 %
mCB05(KPP): R=0.15, BIAS=-350.3 ppt, NME=98.3 %
MOGUNTIA: R=0.14, BIAS=-350.1 ppt, NME=98.2 %
x)
Summit
Greenland (72.596° N, 38.422° W)
mCB05(EBI): R=0.39, BIAS=-1405.4 ppt, NME=99.2 %
mCB05(KPP): R=0.39, BIAS=-1405.7 ppt, NME=99.2 %
MOGUNTIA: R=0.41, BIAS=-1406.3 ppt, NME=99.2 %
y)
Assekrem
Algeria (23.262° N, 5.632° E)
mCB05(EBI): R=-0.09, BIAS=-984.4 ppt, NME=96.9 %
mCB05(KPP): R=-0.10, BIAS=-984.6 ppt, NME=96.9 %
MOGUNTIA: R=-0.02, BIAS=-983.9 ppt, NME=96.8 %
z)
Bukit Kototabang
Indonesia (0.202° S, 100.318° E)
mCB05(EBI): R=-0.12, BIAS=592.4 ppt, NME=84.4 %
mCB05(KPP): R=-0.13, BIAS=578.9 ppt, NME=83.6 %
MOGUNTIA: R=-0.09, BIAS=531.6 ppt, NME=79.4 %
aa)
Ny Alesund Svalbard
Norway and Sweden (78.907° N, 11.888° E)
mCB05(EBI): R=0.27, BIAS=-1524.6 ppt, NME=98.2 %
mCB05(KPP): R=0.27, BIAS=-1524.9 ppt, NME=98.2 %
MOGUNTIA: R=0.26, BIAS=-1526.1 ppt, NME=98.3 %
ab)
Ushuaia
Argentina (54.848° S, 68.311° W)
mCB05(EBI): R=-0.27, BIAS=-249.5 ppt, NME=81.2 %
mCB05(KPP): R=-0.28, BIAS=-250.0 ppt, NME=81.4 %
MOGUNTIA: R=-0.31, BIAS=-250.1 ppt, NME=81.4 %
ac)
Hohenpeissenberg
Germany (47.801° N, 11.024° E)
mCB05(EBI): R=-0.91, BIAS=-1017.5 ppt, NME=71.1 %
mCB05(KPP): R=-0.91, BIAS=-1018.4 ppt, NME=71.1 %
MOGUNTIA: R=-0.91, BIAS=-1022.5 ppt, NME=71.3 %
ad)
Storhofdi Vestmannaeyjar
Iceland (63.4° N, 20.288° W)
mCB05(EBI): R=-0.76, BIAS=-1377.3 ppt, NME=97.1 %
mCB05(KPP): R=-0.76, BIAS=-1377.6 ppt, NME=97.1 %
MOGUNTIA: R=-0.76, BIAS=-1378.6 ppt, NME=97.1 %
ETHANE (ppt)
Month
1 2 3 4 5 6 7 8 9 10 11 12
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


ae) Pallas-Sammaltunturi GAW Station Finland (67.973° N, 24.116° E)
mCB05(EBI): R=-0.62, BIAS=-1422.7 ppt, NME=88.1 %
mCB05(KPP): R=-0.61, BIAS=-1424.6 ppt, NME=88.2 %
MOGUNTIA: R=-0.61, BIAS=-1430.6 ppt, NME=88.5 %
af) Hydrometeorological Observatory of Tiksi Russia (71.597° N, 128.889° E)
mCB05(EBI): R=-0.73, BIAS=-1621.9 ppt, NME=96.1 %
mCB05(KPP): R=-0.73, BIAS=-1622.7 ppt, NME=96.2 %
MOGUNTIA: R=-0.74, BIAS=-1624.9 ppt, NME=96.3 %
ag) Halley Station Antarctica United Kingdom (75.605° S, 26.21° W)
mCB05(EBI): R=0.32, BIAS=-195.4 ppt, NME=96.9 %
mCB05(KPP): R=0.30, BIAS=-195.6 ppt, NME=97.0 %
MOGUNTIA: R=0.29, BIAS=-195.6 ppt, NME=97.0 %
ah) Barrow Atmospheric Baseline Observatory United States (71.323° N, 156.611° W)
mCB05(EBI): R=-0.32, BIAS=-1468.7 ppt, NME=97.9 %
mCB05(KPP): R=-0.31, BIAS=-1469.4 ppt, NME=97.9 %
MOGUNTIA: R=-0.35, BIAS=-1468.2 ppt, NME=97.8 %
ai) Argyle Maine United States (45.035° N, 68.682° W)
mCB05(EBI): R=-0.94, BIAS=-1283.6 ppt, NME=83.2 %
mCB05(KPP): R=-0.94, BIAS=-1286.9 ppt, NME=83.4 %
MOGUNTIA: R=-0.94, BIAS=-1295.5 ppt, NME=84.0 %
aj) Ascension Island United Kingdom (7.967° S, 14.4° W)
mCB05(EBI): R=0.27, BIAS=-412.4 ppt, NME=98.1 %
mCB05(KPP): R=0.27, BIAS=-412.5 ppt, NME=98.1 %
MOGUNTIA: R=0.23, BIAS=-412.1 ppt, NME=98.1 %
ak) Shemya Island Alaska United States (52.711° N, 174.126° E)
mCB05(EBI): R=-0.95, BIAS=-1427.4 ppt, NME=97.4 %
mCB05(KPP): R=-0.95, BIAS=-1428.3 ppt, NME=97.5 %
MOGUNTIA: R=-0.94, BIAS=-1431.2 ppt, NME=97.7 %
al) Tutuila American Samoa (14.247° S, 170.564° W)
mCB05(EBI): R=0.43, BIAS=-241.1 ppt, NME=97.5 %
mCB05(KPP): R=0.43, BIAS=-241.2 ppt, NME=97.5 %
MOGUNTIA: R=0.43, BIAS=-240.9 ppt, NME=97.4 %
am) Black Sea Constanta Romania (44.178° N, 28.665° E)
mCB05(EBI): R=-0.74, BIAS=-2533.4 ppt, NME=76.3 %
mCB05(KPP): R=-0.74, BIAS=-2536.1 ppt, NME=76.4 %
MOGUNTIA: R=-0.74, BIAS=-2551.0 ppt, NME=76.8 %
an) South Pole Antarctica United States (89.98° S, 24.8° W)
mCB05(EBI): R=0.09, BIAS=-240.9 ppt, NME=97.6 %
mCB05(KPP): R=0.08, BIAS=-241.2 ppt, NME=97.7 %
MOGUNTIA: R=0.09, BIAS=-241.2 ppt, NME=97.7 %
ao) Mariana Islands Guam (13.386° N, 144.656° E)
mCB05(EBI): R=-0.85, BIAS=-548.9 ppt, NME=94.8 %
mCB05(KPP): R=-0.85, BIAS=-549.0 ppt, NME=94.8 %
MOGUNTIA: R=-0.85, BIAS=-548.9 ppt, NME=94.8 %
ap) Terceira Island Azores Portugal (38.766° N, 27.375° W)
mCB05(EBI): R=0.22, BIAS=-1162.8 ppt, NME=98.1 %
mCB05(KPP): R=0.21, BIAS=-1163.1 ppt, NME=98.1 %
MOGUNTIA: R=0.18, BIAS=-1163.1 ppt, NME=98.1 %
aq) Baltic Sea Poland (55.35° N, 17.22° E)
mCB05(EBI): R=-0.35, BIAS=-1534.3 ppt, NME=87.3 %
mCB05(KPP): R=-0.34, BIAS=-1535.7 ppt, NME=87.4 %
MOGUNTIA: R=-0.35, BIAS=-1545.0 ppt, NME=87.9 %
ar) Key Biscayne Florida United States (25.665° N, 80.158° W)
mCB05(EBI): R=0.36, BIAS=-1209.7 ppt, NME=96.2 %
mCB05(KPP): R=0.36, BIAS=-1211.1 ppt, NME=96.3 %
MOGUNTIA: R=0.35, BIAS=-1211.7 ppt, NME=96.3 %
as) Mace Head County Galway Ireland (53.326° N, 9.899° W)
mCB05(EBI): R=-0.66, BIAS=-1114.7 ppt, NME=80.4 %
mCB05(KPP): R=-0.66, BIAS=-1114.4 ppt, NME=80.4 %
MOGUNTIA: R=-0.67, BIAS=-1116.9 ppt, NME=80.6 %
ETHANE (ppt)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

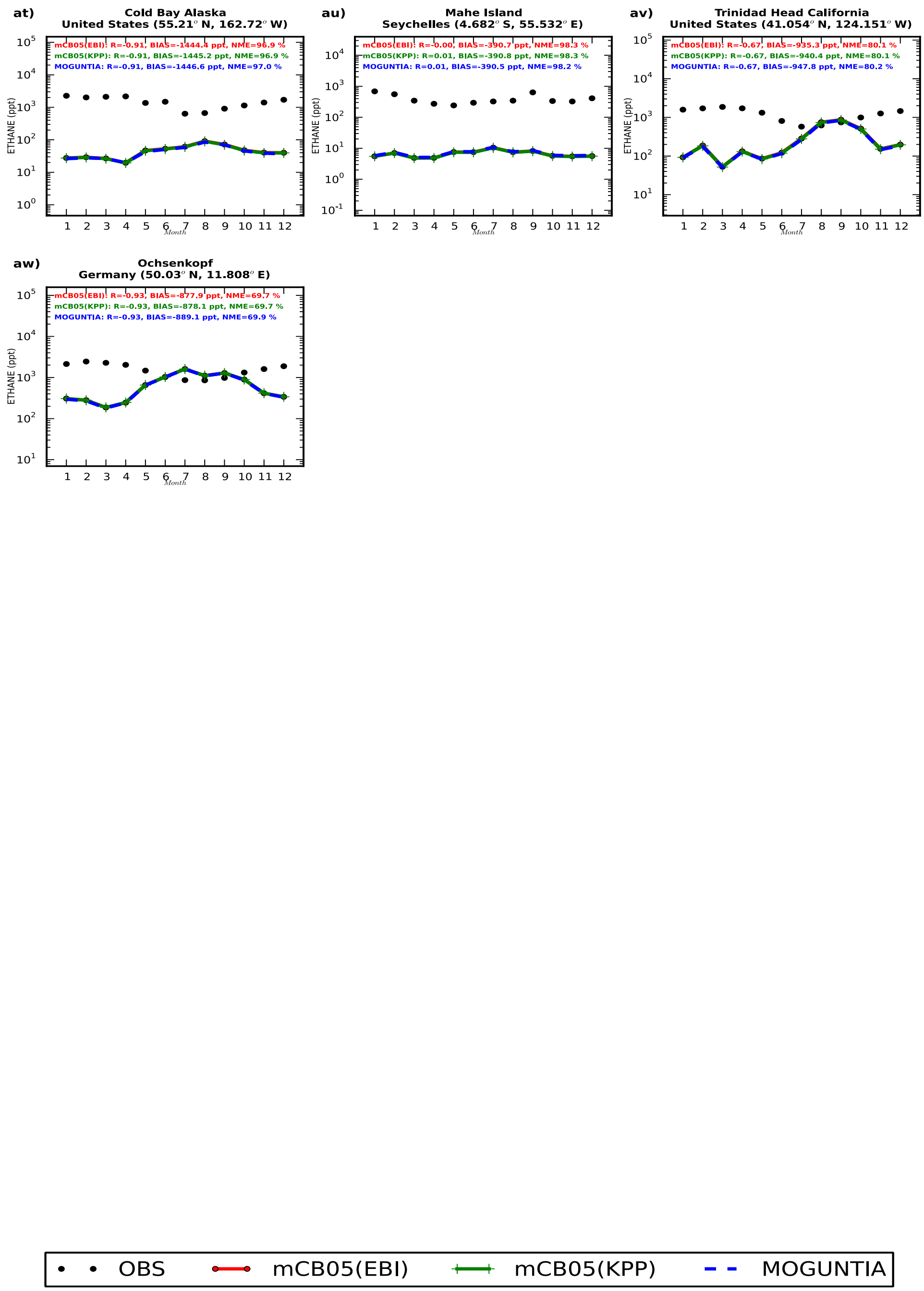
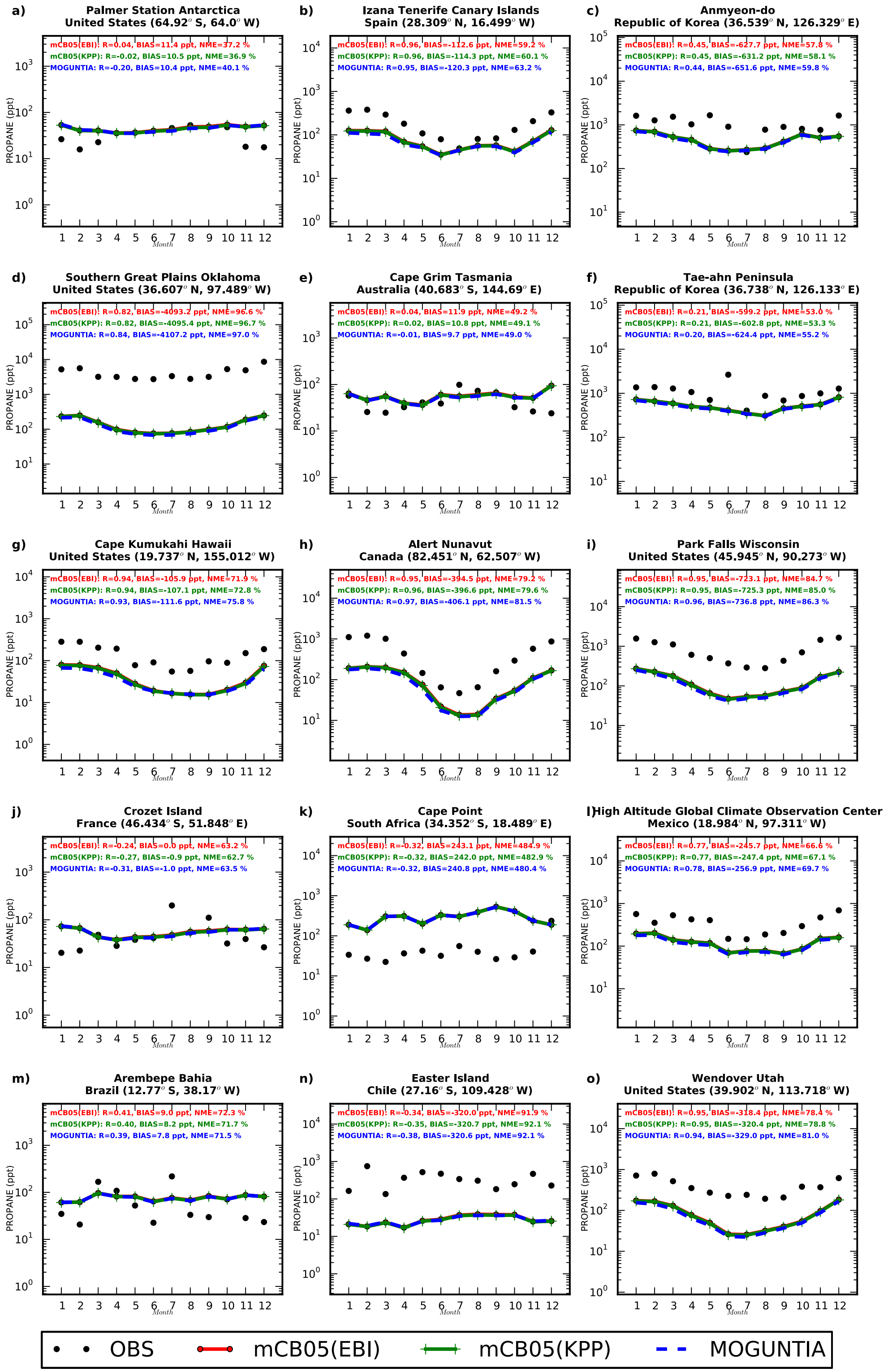
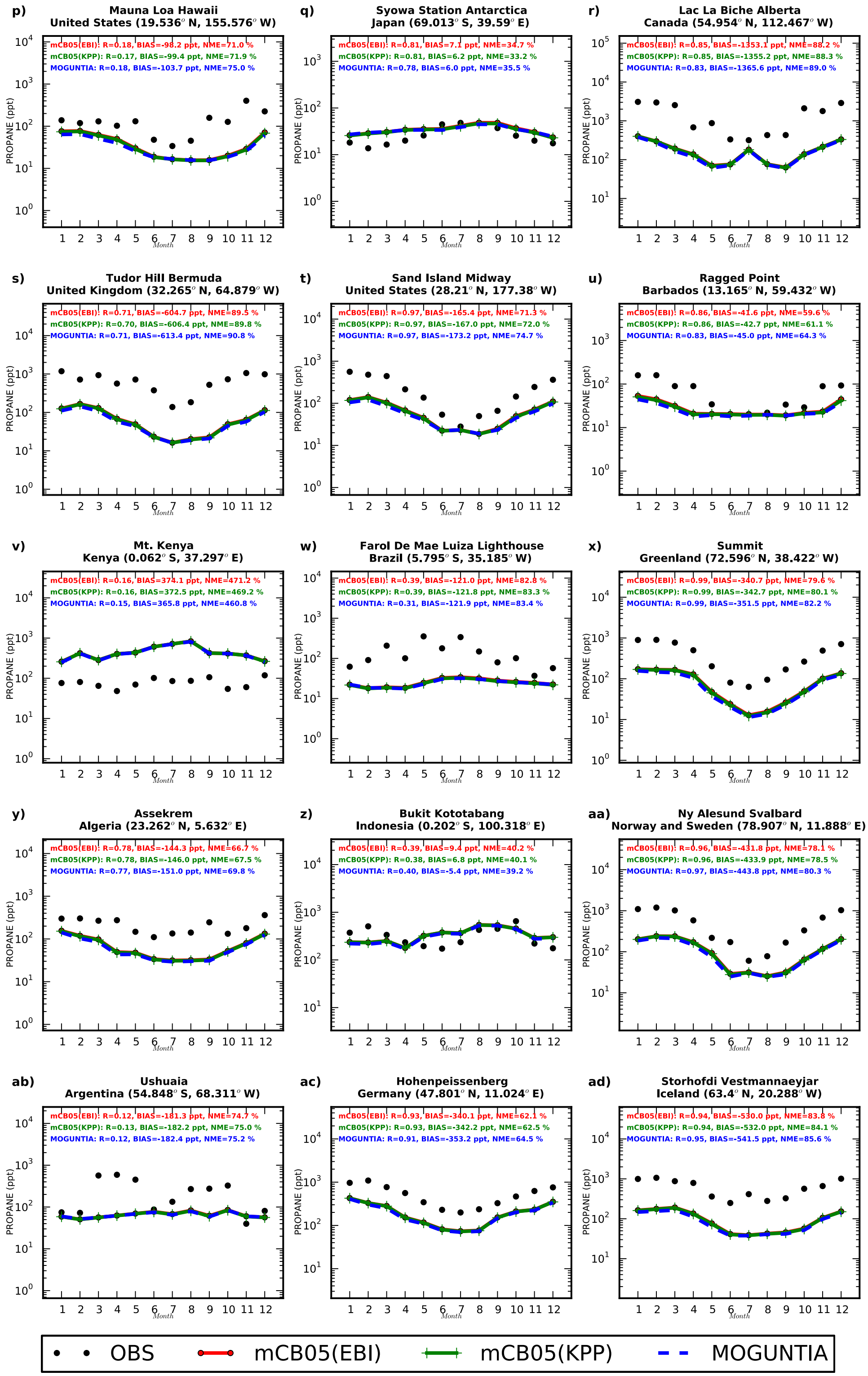
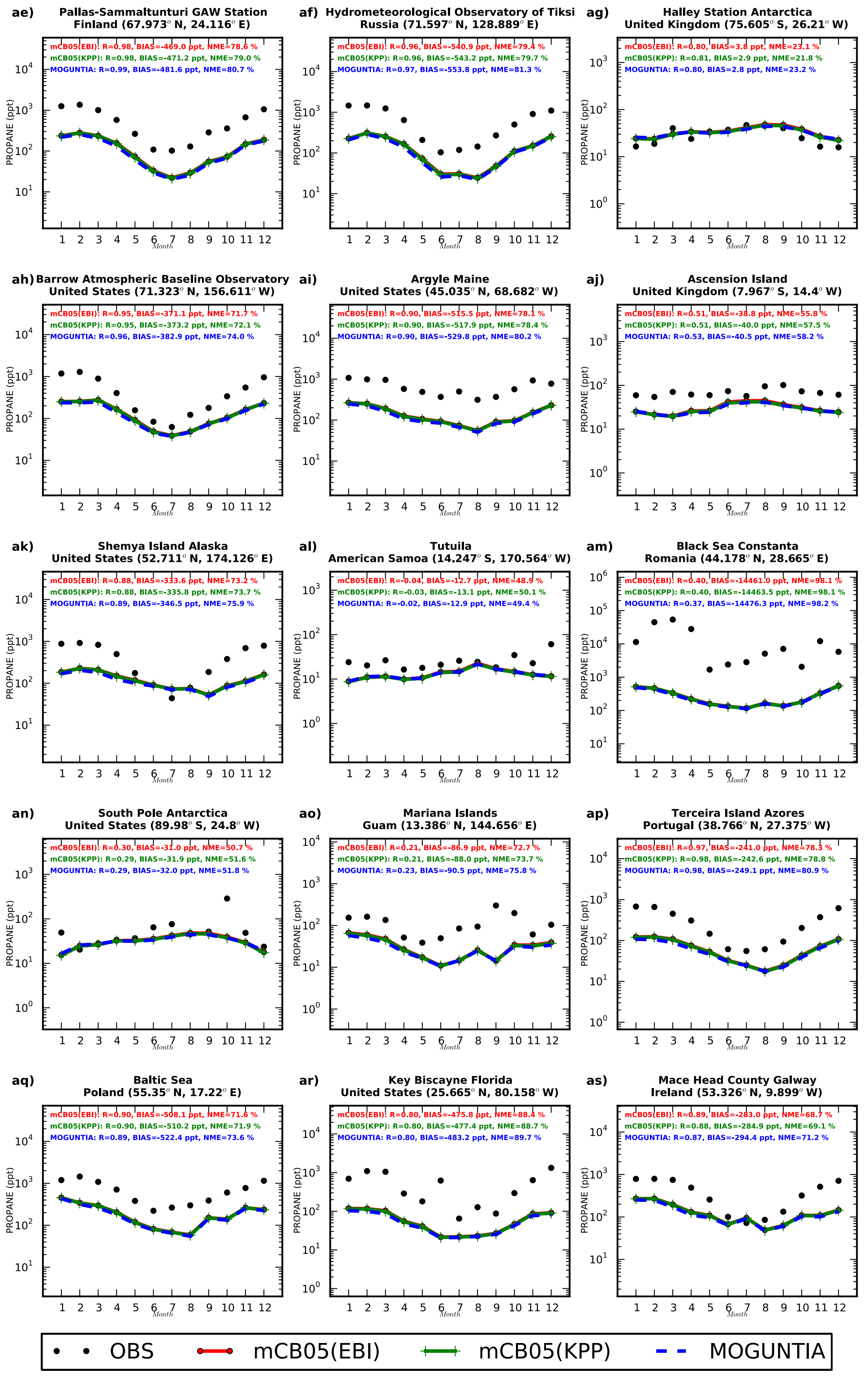


Figure S 5: Comparison of monthly mean surface C_2H_6 flask measurements (black dots) in ppb with model results (red-line for mCB05(EBI), green-line for mCB05(KPP) and blue-line for MOGUNTIA) at various stations around the globe, as obtained from NOAA database, for the year 2006.


a) Palmer Station Antarctica
United States (64.92° S, 64.0° W)
mCB05(EBI): R=0.04, BIAS=11.4 ppt, NME=37.2 %
mCB05(KPP): R=-0.02, BIAS=10.5 ppt, NME=36.9 %
MOGUNTIA: R=-0.20, BIAS=10.4 ppt, NME=40.1 %
b) Izana Tenerife Canary Islands
Spain (28.309° N, 16.499° W)
mCB05(EBI): R=0.96, BIAS=-112.6 ppt, NME=59.2 %
mCB05(KPP): R=0.96, BIAS=-114.3 ppt, NME=60.1 %
MOGUNTIA: R=0.95, BIAS=-120.3 ppt, NME=63.2 %
c) Anmyeon-do
Republic of Korea (36.539° N, 126.329° E)
mCB05(EBI): R=0.45, BIAS=-627.7 ppt, NME=57.8 %
mCB05(KPP): R=0.45, BIAS=-631.2 ppt, NME=58.1 %
MOGUNTIA: R=0.44, BIAS=-651.6 ppt, NME=59.8 %
d) Southern Great Plains Oklahoma
United States (36.607° N, 97.489° W)
mCB05(EBI): R=0.82, BIAS=-4093.2 ppt, NME=96.6 %
mCB05(KPP): R=0.82, BIAS=-4095.4 ppt, NME=96.7 %
MOGUNTIA: R=0.84, BIAS=-4107.2 ppt, NME=97.0 %
e) Cape Grim Tasmania
Australia (40.683° S, 144.69° E)
mCB05(EBI): R=0.04, BIAS=11.9 ppt, NME=49.2 %
mCB05(KPP): R=0.02, BIAS=10.8 ppt, NME=49.1 %
MOGUNTIA: R=-0.01, BIAS=9.7 ppt, NME=49.0 %
f) Tae-ahn Peninsula
Republic of Korea (36.738° N, 126.133° E)
mCB05(EBI): R=0.21, BIAS=-599.2 ppt, NME=53.0 %
mCB05(KPP): R=0.21, BIAS=-602.8 ppt, NME=53.3 %
MOGUNTIA: R=0.20, BIAS=-624.4 ppt, NME=55.2 %
g) Cape Kumukahi Hawaii
United States (19.737° N, 155.012° W)
mCB05(EBI): R=0.94, BIAS=-105.9 ppt, NME=71.9 %
mCB05(KPP): R=0.94, BIAS=-107.1 ppt, NME=72.8 %
MOGUNTIA: R=0.93, BIAS=-111.6 ppt, NME=75.8 %
h) Alert Nunavut
Canada (82.451° N, 62.507° W)
mCB05(EBI): R=0.95, BIAS=-394.5 ppt, NME=79.2 %
mCB05(KPP): R=0.96, BIAS=-396.6 ppt, NME=79.6 %
MOGUNTIA: R=0.97, BIAS=-406.1 ppt, NME=81.5 %
i) Park Falls Wisconsin
United States (45.945° N, 90.273° W)
mCB05(EBI): R=0.95, BIAS=-723.1 ppt, NME=84.7 %
mCB05(KPP): R=0.95, BIAS=-725.3 ppt, NME=85.0 %
MOGUNTIA: R=0.96, BIAS=-736.8 ppt, NME=86.3 %
j) Crozet Island
France (46.434° S, 51.848° E)
mCB05(EBI): R=-0.24, BIAS=0.0 ppt, NME=63.2 %
mCB05(KPP): R=-0.27, BIAS=-0.9 ppt, NME=62.7 %
MOGUNTIA: R=-0.31, BIAS=-1.0 ppt, NME=63.5 %
k) Cape Point
South Africa (34.352° S, 18.489° E)
mCB05(EBI): R=-0.32, BIAS=243.1 ppt, NME=484.9 %
mCB05(KPP): R=-0.32, BIAS=242.0 ppt, NME=482.9 %
MOGUNTIA: R=-0.32, BIAS=240.8 ppt, NME=480.4 %
l) High Altitude Global Climate Observation Center
Mexico (18.984° N, 97.311° W)
mCB05(EBI): R=0.77, BIAS=-245.7 ppt, NME=66.6 %
mCB05(KPP): R=0.77, BIAS=-247.4 ppt, NME=67.1 %
MOGUNTIA: R=0.78, BIAS=-256.9 ppt, NME=69.7 %
m) Arembepe Bahia
Brazil (12.77° S, 38.17° W)
mCB05(EBI): R=0.41, BIAS=9.0 ppt, NME=72.3 %
mCB05(KPP): R=0.40, BIAS=8.2 ppt, NME=71.7 %
MOGUNTIA: R=0.39, BIAS=7.8 ppt, NME=71.5 %
n) Easter Island
Chile (27.16° S, 109.428° W)
mCB05(EBI): R=-0.34, BIAS=-320.0 ppt, NME=91.9 %
mCB05(KPP): R=-0.35, BIAS=-320.7 ppt, NME=92.1 %
MOGUNTIA: R=-0.38, BIAS=-320.6 ppt, NME=92.1 %
o) Wendover Utah
United States (39.902° N, 113.718° W)
mCB05(EBI): R=0.95, BIAS=-318.4 ppt, NME=78.4 %
mCB05(KPP): R=0.95, BIAS=-320.4 ppt, NME=78.8 %
MOGUNTIA: R=0.94, BIAS=-329.0 ppt, NME=81.0 %
PROPANE (ppt)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


p)
Mauna Loa Hawaii
United States (19.536° N, 155.576° W)
mCB05(EBI): R=0.18, BIAS=-98.2 ppt, NME=71.0 %
mCB05(KPP): R=0.17, BIAS=-99.4 ppt, NME=71.9 %
MOGUNTIA: R=0.18, BIAS=-103.7 ppt, NME=75.0 %
q)
Syowa Station Antarctica
Japan (69.013° S, 39.59° E)
mCB05(EBI): R=0.81, BIAS=7.1 ppt, NME=34.7 %
mCB05(KPP): R=0.81, BIAS=6.2 ppt, NME=33.2 %
MOGUNTIA: R=0.78, BIAS=6.0 ppt, NME=35.5 %
r)
Lac La Biche Alberta
Canada (54.954° N, 112.467° W)
mCB05(EBI): R=0.85, BIAS=-1353.1 ppt, NME=88.2 %
mCB05(KPP): R=0.85, BIAS=-1355.2 ppt, NME=88.3 %
MOGUNTIA: R=0.83, BIAS=-1365.6 ppt, NME=89.0 %
s)
Tudor Hill Bermuda
United Kingdom (32.265° N, 64.879° W)
mCB05(EBI): R=0.71, BIAS=-604.7 ppt, NME=89.5 %
mCB05(KPP): R=0.70, BIAS=-606.4 ppt, NME=89.8 %
MOGUNTIA: R=0.71, BIAS=-613.4 ppt, NME=90.8 %
t)
Sand Island Midway
United States (28.21° N, 177.38° W)
mCB05(EBI): R=0.97, BIAS=-165.4 ppt, NME=71.3 %
mCB05(KPP): R=0.97, BIAS=-167.0 ppt, NME=72.0 %
MOGUNTIA: R=0.97, BIAS=-173.2 ppt, NME=74.7 %
u)
Ragged Point
Barbados (13.165° N, 59.432° W)
mCB05(EBI): R=0.86, BIAS=-41.6 ppt, NME=59.6 %
mCB05(KPP): R=0.86, BIAS=-42.7 ppt, NME=61.1 %
MOGUNTIA: R=0.83, BIAS=-45.0 ppt, NME=64.3 %
v)
Mt. Kenya
Kenya (0.062° S, 37.297° E)
mCB05(EBI): R=0.16, BIAS=374.1 ppt, NME=471.2 %
mCB05(KPP): R=0.16, BIAS=372.5 ppt, NME=469.2 %
MOGUNTIA: R=0.15, BIAS=365.8 ppt, NME=460.8 %
w)
Farol De Mae Luiza Lighthouse
Brazil (5.795° S, 35.185° W)
mCB05(EBI): R=0.39, BIAS=-121.0 ppt, NME=82.8 %
mCB05(KPP): R=0.39, BIAS=-121.8 ppt, NME=83.3 %
MOGUNTIA: R=0.31, BIAS=-121.9 ppt, NME=83.4 %
x)
Summit
Greenland (72.596° N, 38.422° W)
mCB05(EBI): R=0.99, BIAS=-340.7 ppt, NME=79.6 %
mCB05(KPP): R=0.99, BIAS=-342.7 ppt, NME=80.1 %
MOGUNTIA: R=0.99, BIAS=-351.5 ppt, NME=82.2 %
y)
Assekrem
Algeria (23.262° N, 5.632° E)
mCB05(EBI): R=0.78, BIAS=-144.3 ppt, NME=66.7 %
mCB05(KPP): R=0.78, BIAS=-146.0 ppt, NME=67.5 %
MOGUNTIA: R=0.77, BIAS=-151.0 ppt, NME=69.8 %
z)
Bukit Kototabang
Indonesia (0.202° S, 100.318° E)
mCB05(EBI): R=0.39, BIAS=9.4 ppt, NME=40.2 %
mCB05(KPP): R=0.38, BIAS=6.8 ppt, NME=40.1 %
MOGUNTIA: R=0.40, BIAS=-5.4 ppt, NME=39.2 %
aa)
Ny Alesund Svalbard
Norway and Sweden (78.907° N, 11.888° E)
mCB05(EBI): R=0.96, BIAS=-431.8 ppt, NME=78.1 %
mCB05(KPP): R=0.96, BIAS=-433.9 ppt, NME=78.5 %
MOGUNTIA: R=0.97, BIAS=-443.8 ppt, NME=80.3 %
ab)
Ushuaia
Argentina (54.848° S, 68.311° W)
mCB05(EBI): R=0.12, BIAS=-181.3 ppt, NME=74.7 %
mCB05(KPP): R=0.13, BIAS=-182.2 ppt, NME=75.0 %
MOGUNTIA: R=0.12, BIAS=-182.4 ppt, NME=75.2 %
ac)
Hohenpeissenberg
Germany (47.801° N, 11.024° E)
mCB05(EBI): R=0.93, BIAS=-340.1 ppt, NME=62.1 %
mCB05(KPP): R=0.93, BIAS=-342.2 ppt, NME=62.5 %
MOGUNTIA: R=0.91, BIAS=-353.2 ppt, NME=64.5 %
ad)
Storhofdi Vestmannaeyjar
Iceland (63.4° N, 20.288° W)
mCB05(EBI): R=0.94, BIAS=-530.0 ppt, NME=83.8 %
mCB05(KPP): R=0.94, BIAS=-532.0 ppt, NME=84.1 %
MOGUNTIA: R=0.95, BIAS=-541.5 ppt, NME=85.6 %
PROPANE (ppt)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA



ae)
Pallas-Sammaltunturi GAW Station
Finland (67.973° N, 24.116° E)
mCB05(EBI): R=0.98, BIAS=-469.0 ppt, NME=78.6 %
mCB05(KPP): R=0.98, BIAS=-471.2 ppt, NME=79.0 %
MOGUNTIA: R=0.99, BIAS=-481.6 ppt, NME=80.7 %
af)
Hydrometeorological Observatory of Tiksi
Russia (71.597° N, 128.889° E)
mCB05(EBI): R=0.96, BIAS=-540.9 ppt, NME=79.4 %
mCB05(KPP): R=0.96, BIAS=-543.2 ppt, NME=79.7 %
MOGUNTIA: R=0.97, BIAS=-553.8 ppt, NME=81.3 %
ag)
Halley Station Antarctica
United Kingdom (75.605° S, 26.21° W)
mCB05(EBI): R=0.80, BIAS=3.8 ppt, NME=23.1 %
mCB05(KPP): R=0.81, BIAS=2.9 ppt, NME=21.8 %
MOGUNTIA: R=0.80, BIAS=2.8 ppt, NME=23.2 %
ah)
Barrow Atmospheric Baseline Observatory
United States (71.323° N, 156.611° W)
mCB05(EBI): R=0.95, BIAS=-371.1 ppt, NME=71.7 %
mCB05(KPP): R=0.95, BIAS=-373.2 ppt, NME=72.1 %
MOGUNTIA: R=0.96, BIAS=-382.9 ppt, NME=74.0 %
ai)
Argyle Maine
United States (45.035° N, 68.682° W)
mCB05(EBI): R=0.90, BIAS=-515.5 ppt, NME=78.1 %
mCB05(KPP): R=0.90, BIAS=-517.9 ppt, NME=78.4 %
MOGUNTIA: R=0.90, BIAS=-529.8 ppt, NME=80.2 %
aj)
Ascension Island
United Kingdom (7.967° S, 14.4° W)
mCB05(EBI): R=0.51, BIAS=-38.8 ppt, NME=55.8 %
mCB05(KPP): R=0.51, BIAS=-40.0 ppt, NME=57.5 %
MOGUNTIA: R=0.53, BIAS=-40.5 ppt, NME=58.2 %
ak)
Shemya Island Alaska
United States (52.711° N, 174.126° E)
mCB05(EBI): R=0.88, BIAS=-333.6 ppt, NME=73.2 %
mCB05(KPP): R=0.88, BIAS=-335.8 ppt, NME=73.7 %
MOGUNTIA: R=0.89, BIAS=-346.5 ppt, NME=75.9 %
al)
Tutuila
American Samoa (14.247° S, 170.564° W)
mCB05(EBI): R=-0.04, BIAS=-12.7 ppt, NME=48.9 %
mCB05(KPP): R=-0.03, BIAS=-13.1 ppt, NME=50.1 %
MOGUNTIA: R=-0.02, BIAS=-12.9 ppt, NME=49.4 %
am)
Black Sea Constanta
Romania (44.178° N, 28.665° E)
mCB05(EBI): R=0.40, BIAS=-14461.0 ppt, NME=98.1 %
mCB05(KPP): R=0.40, BIAS=-14463.5 ppt, NME=98.1 %
MOGUNTIA: R=0.37, BIAS=-14476.3 ppt, NME=98.2 %
an)
South Pole Antarctica
United States (89.98° S, 24.8° W)
mCB05(EBI): R=0.30, BIAS=-31.0 ppt, NME=50.7 %
mCB05(KPP): R=0.29, BIAS=-31.9 ppt, NME=51.6 %
MOGUNTIA: R=0.29, BIAS=-32.0 ppt, NME=51.8 %
ao)
Mariana Islands
Guam (13.386° N, 144.656° E)
mCB05(EBI): R=0.21, BIAS=-86.9 ppt, NME=72.7 %
mCB05(KPP): R=0.21, BIAS=-88.0 ppt, NME=73.7 %
MOGUNTIA: R=0.23, BIAS=-90.5 ppt, NME=75.8 %
ap)
Terceira Island Azores
Portugal (38.766° N, 27.375° W)
mCB05(EBI): R=0.97, BIAS=-241.0 ppt, NME=78.3 %
mCB05(KPP): R=0.98, BIAS=-242.6 ppt, NME=78.8 %
MOGUNTIA: R=0.98, BIAS=-249.1 ppt, NME=80.9 %
aq)
Baltic Sea
Poland (55.35° N, 17.22° E)
mCB05(EBI): R=0.90, BIAS=-508.1 ppt, NME=71.6 %
mCB05(KPP): R=0.90, BIAS=-510.2 ppt, NME=71.9 %
MOGUNTIA: R=0.89, BIAS=-522.4 ppt, NME=73.6 %
ar)
Key Biscayne Florida
United States (25.665° N, 80.158° W)
mCB05(EBI): R=0.80, BIAS=-475.8 ppt, NME=88.4 %
mCB05(KPP): R=0.80, BIAS=-477.4 ppt, NME=88.7 %
MOGUNTIA: R=0.80, BIAS=-483.2 ppt, NME=89.7 %
as)
Mace Head County Galway
Ireland (53.326° N, 9.899° W)
mCB05(EBI): R=0.89, BIAS=-283.0 ppt, NME=68.7 %
mCB05(KPP): R=0.88, BIAS=-284.9 ppt, NME=69.1 %
MOGUNTIA: R=0.87, BIAS=-294.4 ppt, NME=71.2 %
PROPANE (ppt)
Month
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

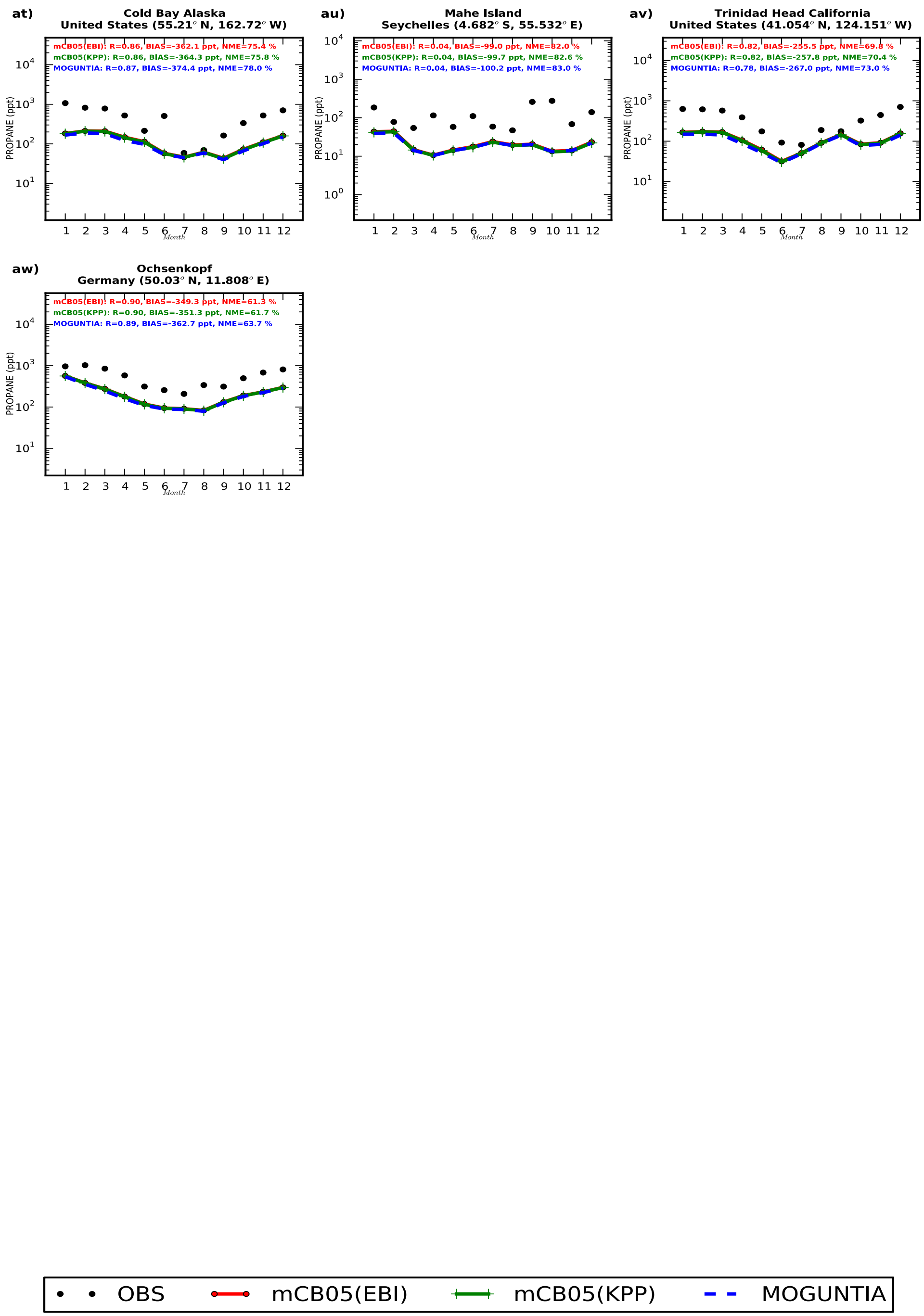
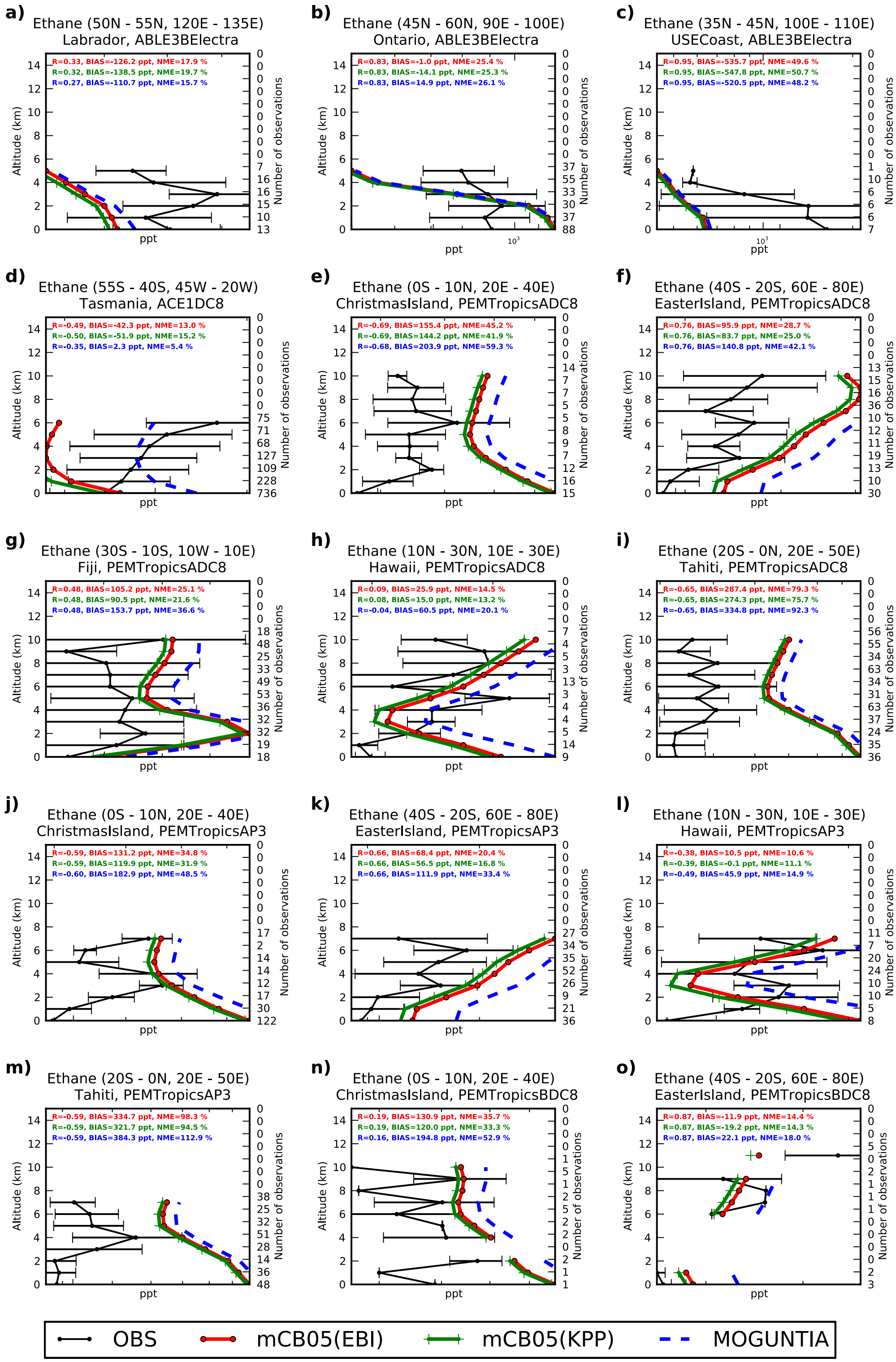
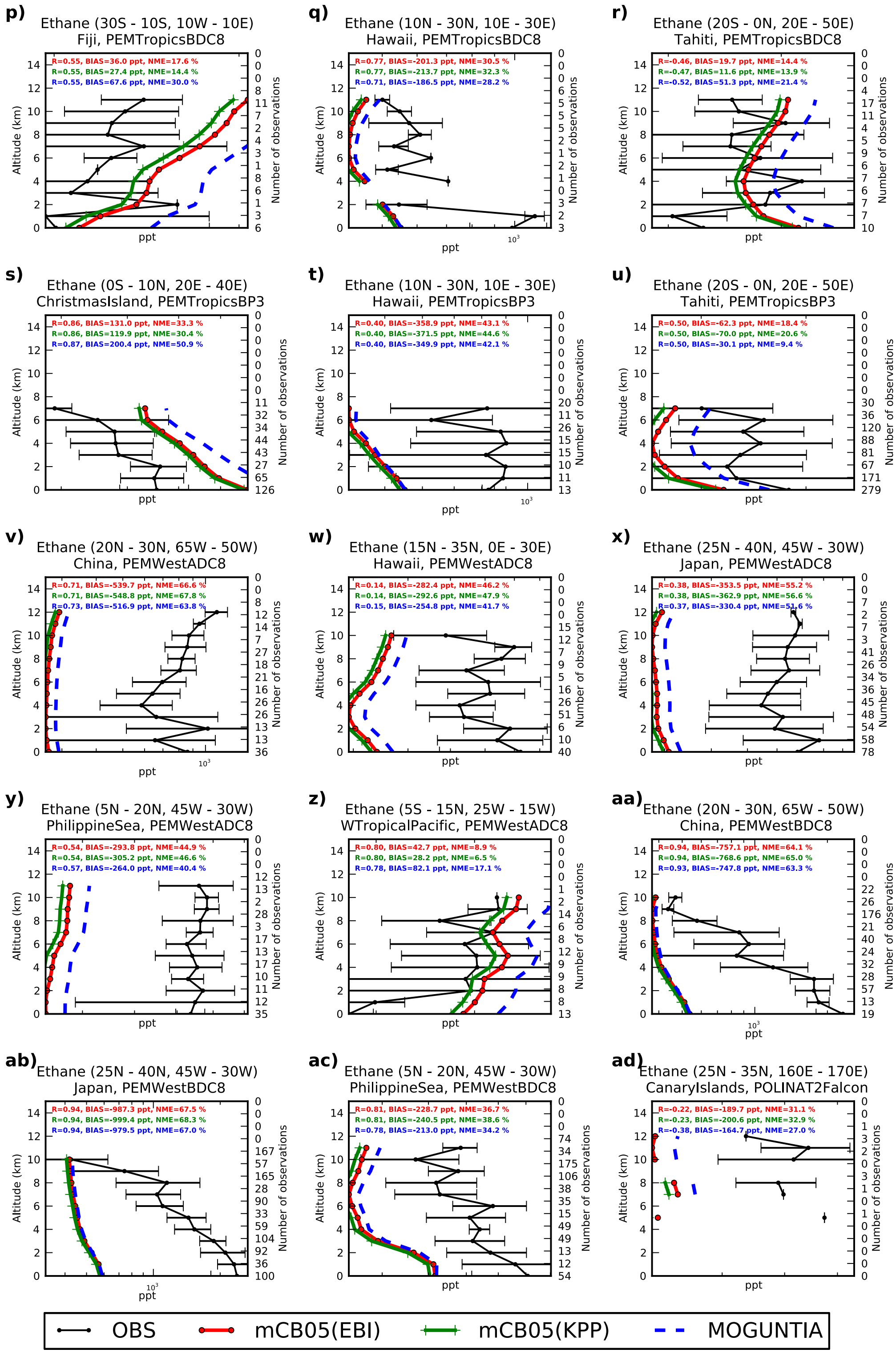


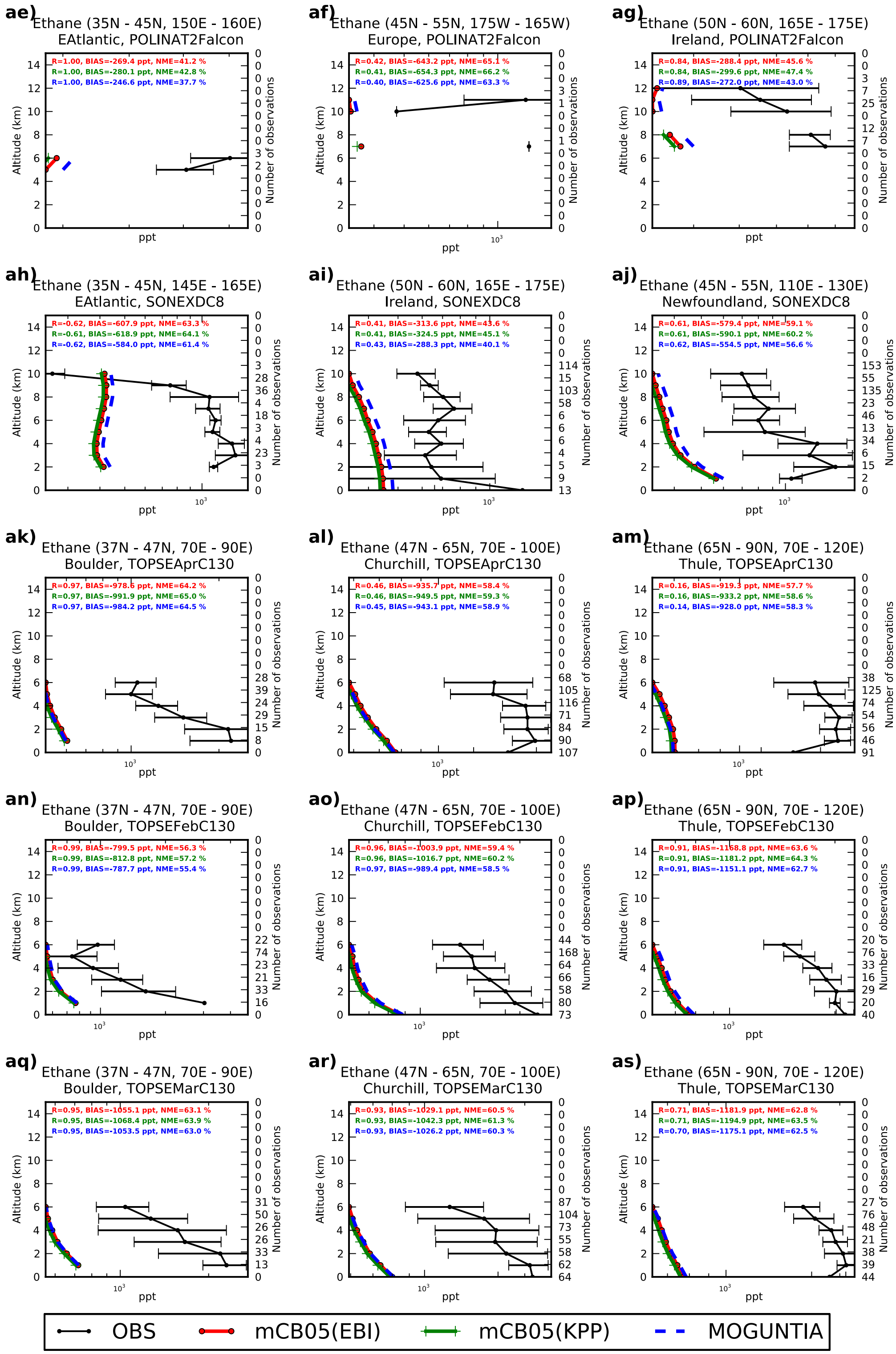
Figure S 6: Comparison of monthly mean surface propane flask measurements (black dots) in ppb with model results (red-line for mCB05(EBI), green-line for mCB05(KPP) and blue-line for MOGUNTIA) at various stations around the globe, as obtained from NOAA database, for the year 2006.

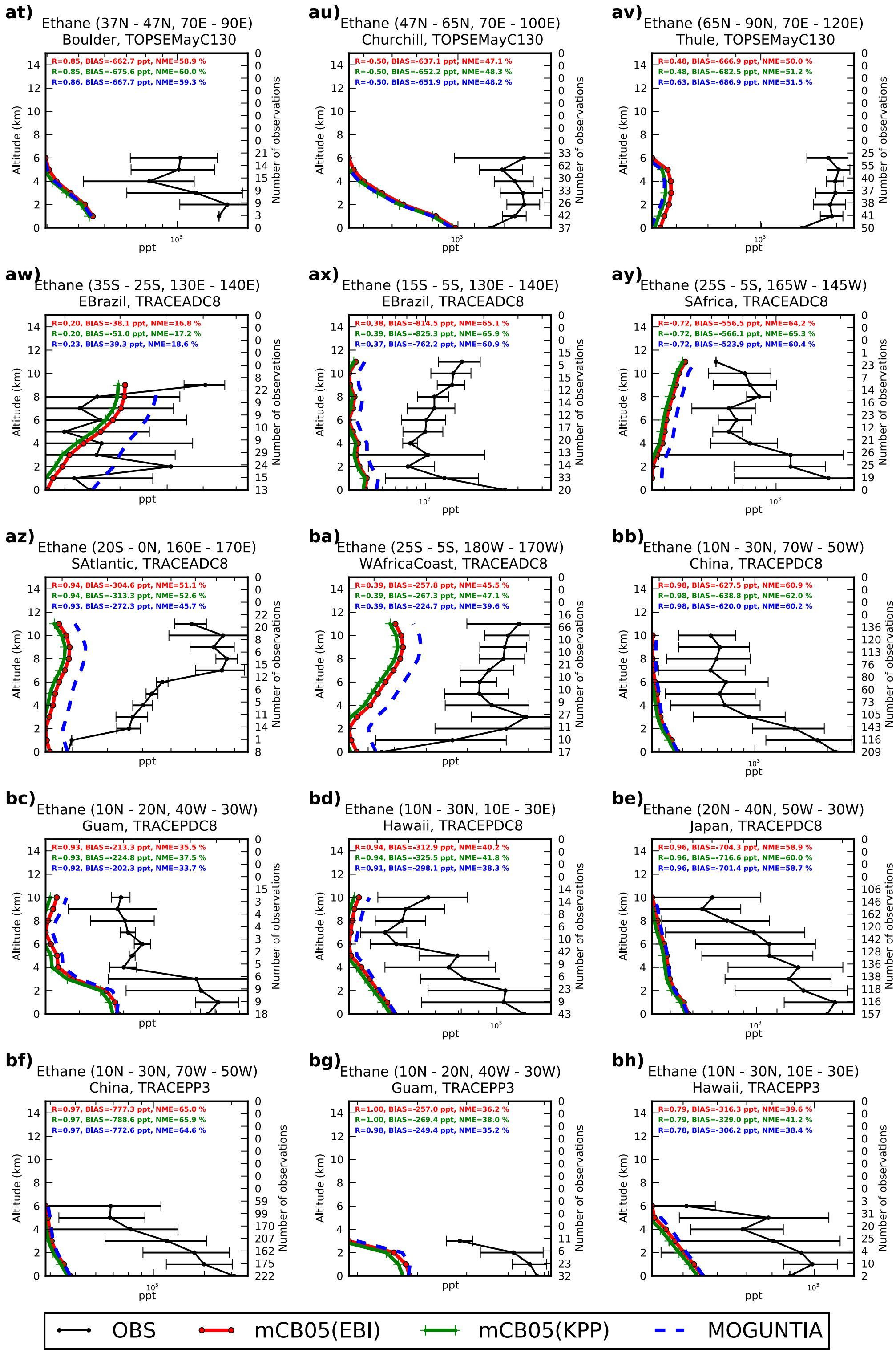
5



a) Ethane (50N - 55N, 120E - 135E) Labrador, ABLE3BElectra
R=0.33, BIAS=-126.2 ppt, NME=17.9 %
R=0.32, BIAS=-138.5 ppt, NME=19.7 %
R=0.27, BIAS=-110.7 ppt, NME=15.7 %
b) Ethane (45N - 60N, 90E - 100E) Ontario, ABLE3BElectra
R=0.83, BIAS=-1.0 ppt, NME=25.4 %
R=0.83, BIAS=-14.1 ppt, NME=25.3 %
R=0.83, BIAS=14.9 ppt, NME=26.1 %
c) Ethane (35N - 45N, 100E - 110E) USECoast, ABLE3BElectra
R=0.95, BIAS=-535.7 ppt, NME=49.6 %
R=0.95, BIAS=-547.8 ppt, NME=50.7 %
R=0.95, BIAS=-520.5 ppt, NME=48.2 %
d) Ethane (55S - 40S, 45W - 20W) Tasmania, ACE1DC8
R=-0.49, BIAS=-42.3 ppt, NME=13.0 %
R=-0.50, BIAS=-51.9 ppt, NME=15.2 %
R=-0.35, BIAS=2.3 ppt, NME=5.4 %
e) Ethane (0S - 10N, 20E - 40E) ChristmasIsland, PEMTropicsADC8
R=-0.69, BIAS=155.4 ppt, NME=45.2 %
R=-0.69, BIAS=144.2 ppt, NME=41.9 %
R=-0.68, BIAS=203.9 ppt, NME=59.3 %
f) Ethane (40S - 20S, 60E - 80E) EasterIsland, PEMTropicsADC8
R=0.76, BIAS=95.9 ppt, NME=28.7 %
R=0.76, BIAS=83.7 ppt, NME=25.0 %
R=0.76, BIAS=140.8 ppt, NME=42.1 %
g) Ethane (30S - 10S, 10W - 10E) Fiji, PEMTropicsADC8
R=0.48, BIAS=105.2 ppt, NME=25.1 %
R=0.48, BIAS=90.5 ppt, NME=21.6 %
R=0.48, BIAS=153.7 ppt, NME=36.6 %
h) Ethane (10N - 30N, 10E - 30E) Hawaii, PEMTropicsADC8
R=0.09, BIAS=25.9 ppt, NME=14.5 %
R=0.08, BIAS=15.0 ppt, NME=13.2 %
R=-0.04, BIAS=60.5 ppt, NME=20.1 %
i) Ethane (20S - 0N, 20E - 50E) Tahiti, PEMTropicsADC8
R=-0.65, BIAS=287.4 ppt, NME=79.3 %
R=-0.65, BIAS=274.3 ppt, NME=75.7 %
R=-0.65, BIAS=334.8 ppt, NME=92.3 %
j) Ethane (0S - 10N, 20E - 40E) ChristmasIsland, PEMTropicsAP3
R=-0.59, BIAS=131.2 ppt, NME=34.8 %
R=-0.59, BIAS=119.9 ppt, NME=31.9 %
R=-0.60, BIAS=182.9 ppt, NME=48.5 %
k) Ethane (40S - 20S, 60E - 80E) EasterIsland, PEMTropicsAP3
R=0.66, BIAS=68.4 ppt, NME=20.4 %
R=0.66, BIAS=56.5 ppt, NME=16.8 %
R=0.66, BIAS=111.9 ppt, NME=33.4 %
l) Ethane (10N - 30N, 10E - 30E) Hawaii, PEMTropicsAP3
R=-0.38, BIAS=10.5 ppt, NME=10.6 %
R=-0.39, BIAS=-0.1 ppt, NME=11.1 %
R=-0.49, BIAS=45.9 ppt, NME=14.9 %
m) Ethane (20S - 0N, 20E - 50E) Tahiti, PEMTropicsAP3
R=-0.59, BIAS=334.7 ppt, NME=98.3 %
R=-0.59, BIAS=321.7 ppt, NME=94.5 %
R=-0.59, BIAS=384.3 ppt, NME=112.9 %
n) Ethane (0S - 10N, 20E - 40E) ChristmasIsland, PEMTropicsBDC8
R=0.19, BIAS=130.9 ppt, NME=35.7 %
R=0.19, BIAS=120.0 ppt, NME=33.3 %
R=0.16, BIAS=194.8 ppt, NME=52.9 %
o) Ethane (40S - 20S, 60E - 80E) EasterIsland, PEMTropicsBDC8
R=0.87, BIAS=-11.9 ppt, NME=14.4 %
R=0.87, BIAS=-19.2 ppt, NME=14.3 %
R=0.87, BIAS=22.1 ppt, NME=18.0 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


p) Ethane (30S - 10S, 10W - 10E)
Fiji, PEMTropicsBDC8
R=0.55, BIAS=36.0 ppt, NME=17.6 %
R=0.55, BIAS=27.4 ppt, NME=14.4 %
R=0.55, BIAS=67.6 ppt, NME=30.0 %
q) Ethane (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsBDC8
R=0.77, BIAS=-201.3 ppt, NME=30.5 %
R=0.77, BIAS=-213.7 ppt, NME=32.3 %
R=0.71, BIAS=-186.5 ppt, NME=28.2 %
r) Ethane (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsBDC8
R=-0.46, BIAS=19.7 ppt, NME=14.4 %
R=-0.47, BIAS=11.6 ppt, NME=13.9 %
R=-0.52, BIAS=51.3 ppt, NME=21.4 %
s) Ethane (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsBP3
R=0.86, BIAS=131.0 ppt, NME=33.3 %
R=0.86, BIAS=119.9 ppt, NME=30.4 %
R=0.87, BIAS=200.4 ppt, NME=50.9 %
t) Ethane (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsBP3
R=0.40, BIAS=-358.9 ppt, NME=43.1 %
R=0.40, BIAS=-371.5 ppt, NME=44.6 %
R=0.40, BIAS=-349.9 ppt, NME=42.1 %
u) Ethane (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsBP3
R=0.50, BIAS=-62.3 ppt, NME=18.4 %
R=0.50, BIAS=-70.0 ppt, NME=20.6 %
R=0.50, BIAS=-30.1 ppt, NME=9.4 %
v) Ethane (20N - 30N, 65W - 50W)
China, PEMWestADC8
R=0.71, BIAS=-539.7 ppt, NME=66.6 %
R=0.71, BIAS=-548.8 ppt, NME=67.8 %
R=0.73, BIAS=-516.9 ppt, NME=63.8 %
w) Ethane (15N - 35N, 0E - 30E)
Hawaii, PEMWestADC8
R=0.14, BIAS=-282.4 ppt, NME=46.2 %
R=0.14, BIAS=-292.6 ppt, NME=47.9 %
R=0.15, BIAS=-254.8 ppt, NME=41.7 %
x) Ethane (25N - 40N, 45W - 30W)
Japan, PEMWestADC8
R=0.38, BIAS=-353.5 ppt, NME=55.2 %
R=0.38, BIAS=-362.9 ppt, NME=56.6 %
R=0.37, BIAS=-330.4 ppt, NME=51.6 %
y) Ethane (5N - 20N, 45W - 30W)
PhilippineSea, PEMWestADC8
R=0.54, BIAS=-293.8 ppt, NME=44.9 %
R=0.54, BIAS=-305.2 ppt, NME=46.6 %
R=0.57, BIAS=-264.0 ppt, NME=40.4 %
z) Ethane (5S - 15N, 25W - 15W)
WTropicalPacific, PEMWestADC8
R=0.80, BIAS=42.7 ppt, NME=8.9 %
R=0.80, BIAS=28.2 ppt, NME=6.5 %
R=0.78, BIAS=82.1 ppt, NME=17.1 %
aa) Ethane (20N - 30N, 65W - 50W)
China, PEMWestBDC8
R=0.94, BIAS=-757.1 ppt, NME=64.1 %
R=0.94, BIAS=-768.6 ppt, NME=65.0 %
R=0.93, BIAS=-747.8 ppt, NME=63.3 %
ab) Ethane (25N - 40N, 45W - 30W)
Japan, PEMWestBDC8
R=0.94, BIAS=-987.3 ppt, NME=67.5 %
R=0.94, BIAS=-999.4 ppt, NME=68.3 %
R=0.94, BIAS=-979.5 ppt, NME=67.0 %
ac) Ethane (5N - 20N, 45W - 30W)
PhilippineSea, PEMWestBDC8
R=0.81, BIAS=-228.7 ppt, NME=36.7 %
R=0.81, BIAS=-240.5 ppt, NME=38.6 %
R=0.78, BIAS=-213.0 ppt, NME=34.2 %
ad) Ethane (25N - 35N, 160E - 170E)
CanaryIslands, POLINAT2Falcon
R=-0.22, BIAS=-189.7 ppt, NME=31.1 %
R=-0.23, BIAS=-200.6 ppt, NME=32.9 %
R=-0.38, BIAS=-164.7 ppt, NME=27.0 %
Altitude (km)
Number of observations
ppt
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


ae) Ethane (35N - 45N, 150E - 160E)
EAtlantic, POLINAT2Falcon
R=1.00, BIAS=-269.4 ppt, NME=41.2 %
R=1.00, BIAS=-280.1 ppt, NME=42.8 %
R=1.00, BIAS=-246.6 ppt, NME=37.7 %
af) Ethane (45N - 55N, 175W - 165W)
Europe, POLINAT2Falcon
R=0.42, BIAS=-643.2 ppt, NME=65.1 %
R=0.41, BIAS=-654.3 ppt, NME=66.2 %
R=0.40, BIAS=-625.6 ppt, NME=63.3 %
ag) Ethane (50N - 60N, 165E - 175E)
Ireland, POLINAT2Falcon
R=0.84, BIAS=-288.4 ppt, NME=45.6 %
R=0.84, BIAS=-299.6 ppt, NME=47.4 %
R=0.89, BIAS=-272.0 ppt, NME=43.0 %
ah) Ethane (35N - 45N, 145E - 165E)
EAtlantic, SONEXDC8
R=-0.62, BIAS=-607.9 ppt, NME=63.3 %
R=-0.61, BIAS=-618.9 ppt, NME=64.1 %
R=-0.62, BIAS=-584.0 ppt, NME=61.4 %
ai) Ethane (50N - 60N, 165E - 175E)
Ireland, SONEXDC8
R=0.41, BIAS=-313.6 ppt, NME=43.6 %
R=0.41, BIAS=-324.5 ppt, NME=45.1 %
R=0.43, BIAS=-288.3 ppt, NME=40.1 %
aj) Ethane (45N - 55N, 110E - 130E)
Newfoundland, SONEXDC8
R=0.61, BIAS=-579.4 ppt, NME=59.1 %
R=0.61, BIAS=-590.1 ppt, NME=60.2 %
R=0.62, BIAS=-554.5 ppt, NME=56.6 %
ak) Ethane (37N - 47N, 70E - 90E)
Boulder, TOPSEAprC130
R=0.97, BIAS=-978.6 ppt, NME=64.2 %
R=0.97, BIAS=-991.9 ppt, NME=65.0 %
R=0.97, BIAS=-984.2 ppt, NME=64.5 %
al) Ethane (47N - 65N, 70E - 100E)
Churchill, TOPSEAprC130
R=0.46, BIAS=-935.7 ppt, NME=58.4 %
R=0.46, BIAS=-949.5 ppt, NME=59.3 %
R=0.45, BIAS=-943.1 ppt, NME=58.9 %
am) Ethane (65N - 90N, 70E - 120E)
Thule, TOPSEAprC130
R=0.16, BIAS=-919.3 ppt, NME=57.7 %
R=0.16, BIAS=-933.2 ppt, NME=58.6 %
R=0.14, BIAS=-928.0 ppt, NME=58.3 %
an) Ethane (37N - 47N, 70E - 90E)
Boulder, TOPSEFebC130
R=0.99, BIAS=-799.5 ppt, NME=56.3 %
R=0.99, BIAS=-812.8 ppt, NME=57.2 %
R=0.99, BIAS=-787.7 ppt, NME=55.4 %
ao) Ethane (47N - 65N, 70E - 100E)
Churchill, TOPSEFebC130
R=0.96, BIAS=-1003.9 ppt, NME=59.4 %
R=0.96, BIAS=-1016.7 ppt, NME=60.2 %
R=0.97, BIAS=-989.4 ppt, NME=58.5 %
ap) Ethane (65N - 90N, 70E - 120E)
Thule, TOPSEFebC130
R=0.91, BIAS=-1168.8 ppt, NME=63.6 %
R=0.91, BIAS=-1181.2 ppt, NME=64.3 %
R=0.91, BIAS=-1151.1 ppt, NME=62.7 %
aq) Ethane (37N - 47N, 70E - 90E)
Boulder, TOPSEMarC130
R=0.95, BIAS=-1055.1 ppt, NME=63.1 %
R=0.95, BIAS=-1068.4 ppt, NME=63.9 %
R=0.95, BIAS=-1053.5 ppt, NME=63.0 %
ar) Ethane (47N - 65N, 70E - 100E)
Churchill, TOPSEMarC130
R=0.93, BIAS=-1029.1 ppt, NME=60.5 %
R=0.93, BIAS=-1042.3 ppt, NME=61.3 %
R=0.93, BIAS=-1026.2 ppt, NME=60.3 %
as) Ethane (65N - 90N, 70E - 120E)
Thule, TOPSEMarC130
R=0.71, BIAS=-1181.9 ppt, NME=62.8 %
R=0.71, BIAS=-1194.9 ppt, NME=63.5 %
R=0.70, BIAS=-1175.1 ppt, NME=62.5 %
Altitude (km)
Number of observations
ppt
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


at) Ethane (37N - 47N, 70E - 90E)
Boulder, TOPSEMayC130
au) Ethane (47N - 65N, 70E - 100E)
Churchill, TOPSEMayC130
av) Ethane (65N - 90N, 70E - 120E)
Thule, TOPSEMayC130
aw) Ethane (35S - 25S, 130E - 140E)
EBrazil, TRACEADC8
ax) Ethane (15S - 5S, 130E - 140E)
EBrazil, TRACEADC8
ay) Ethane (25S - 5S, 165W - 145W)
SAfrica, TRACEADC8
az) Ethane (20S - 0N, 160E - 170E)
SAtlantic, TRACEADC8
ba) Ethane (25S - 5S, 180W - 170W)
WAfricaCoast, TRACEADC8
bb) Ethane (10N - 30N, 70W - 50W)
China, TRACEPDC8
bc) Ethane (10N - 20N, 40W - 30W)
Guam, TRACEPDC8
bd) Ethane (10N - 30N, 10E - 30E)
Hawaii, TRACEPDC8
be) Ethane (20N - 40N, 50W - 30W)
Japan, TRACEPDC8
bf) Ethane (10N - 30N, 70W - 50W)
China, TRACEPP3
bg) Ethane (10N - 20N, 40W - 30W)
Guam, TRACEPP3
bh) Ethane (10N - 30N, 10E - 30E)
Hawaii, TRACEPP3
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

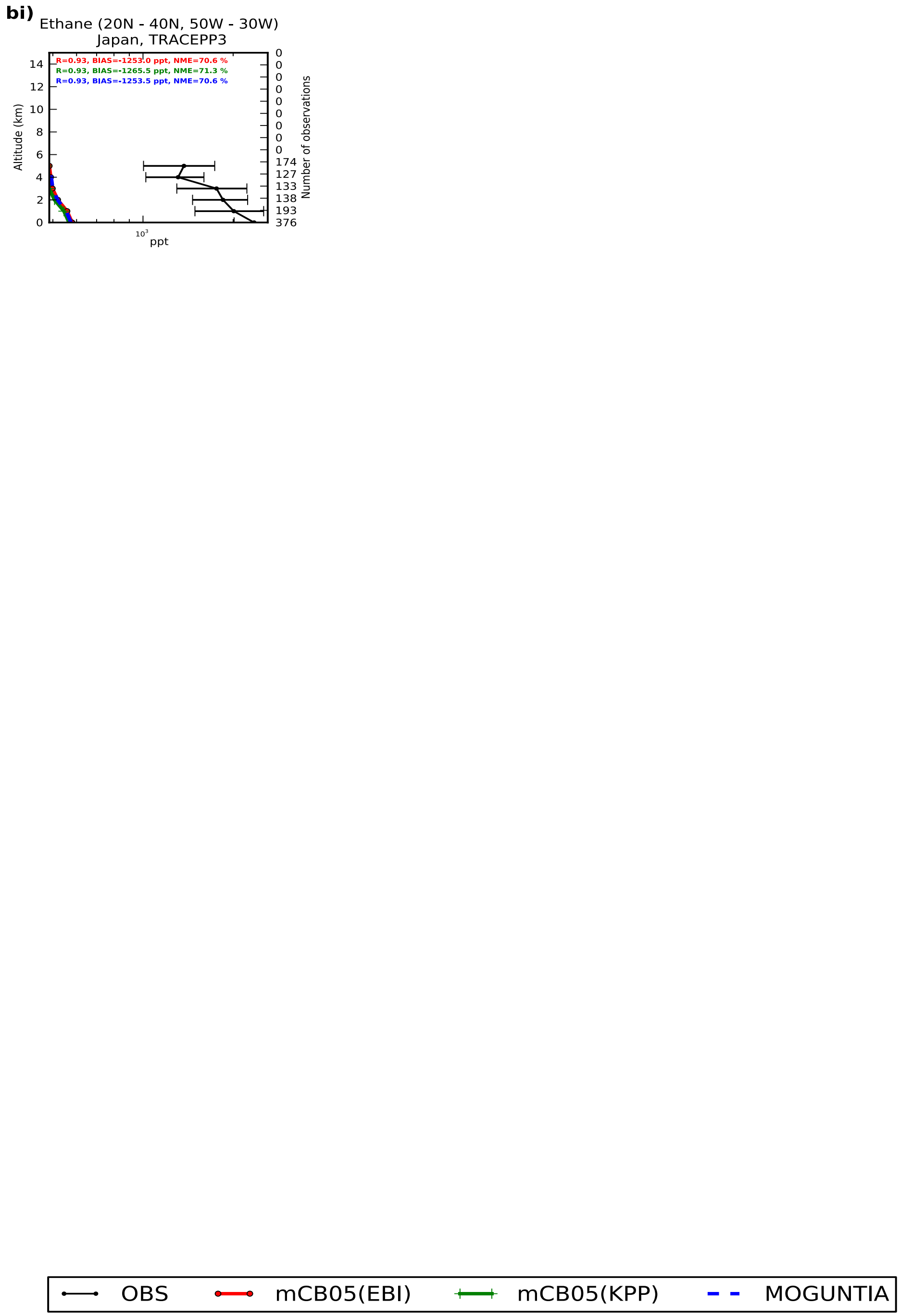
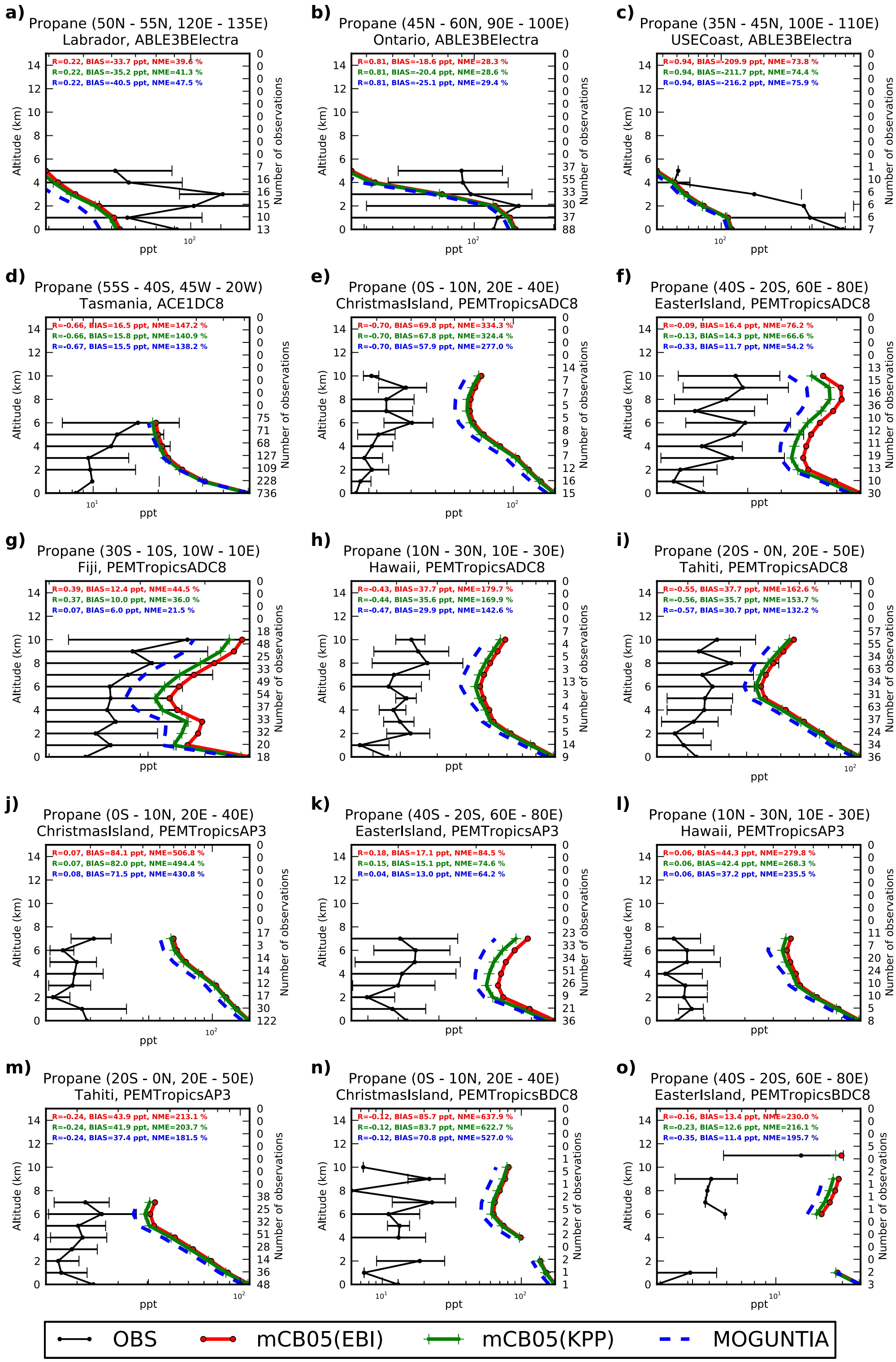
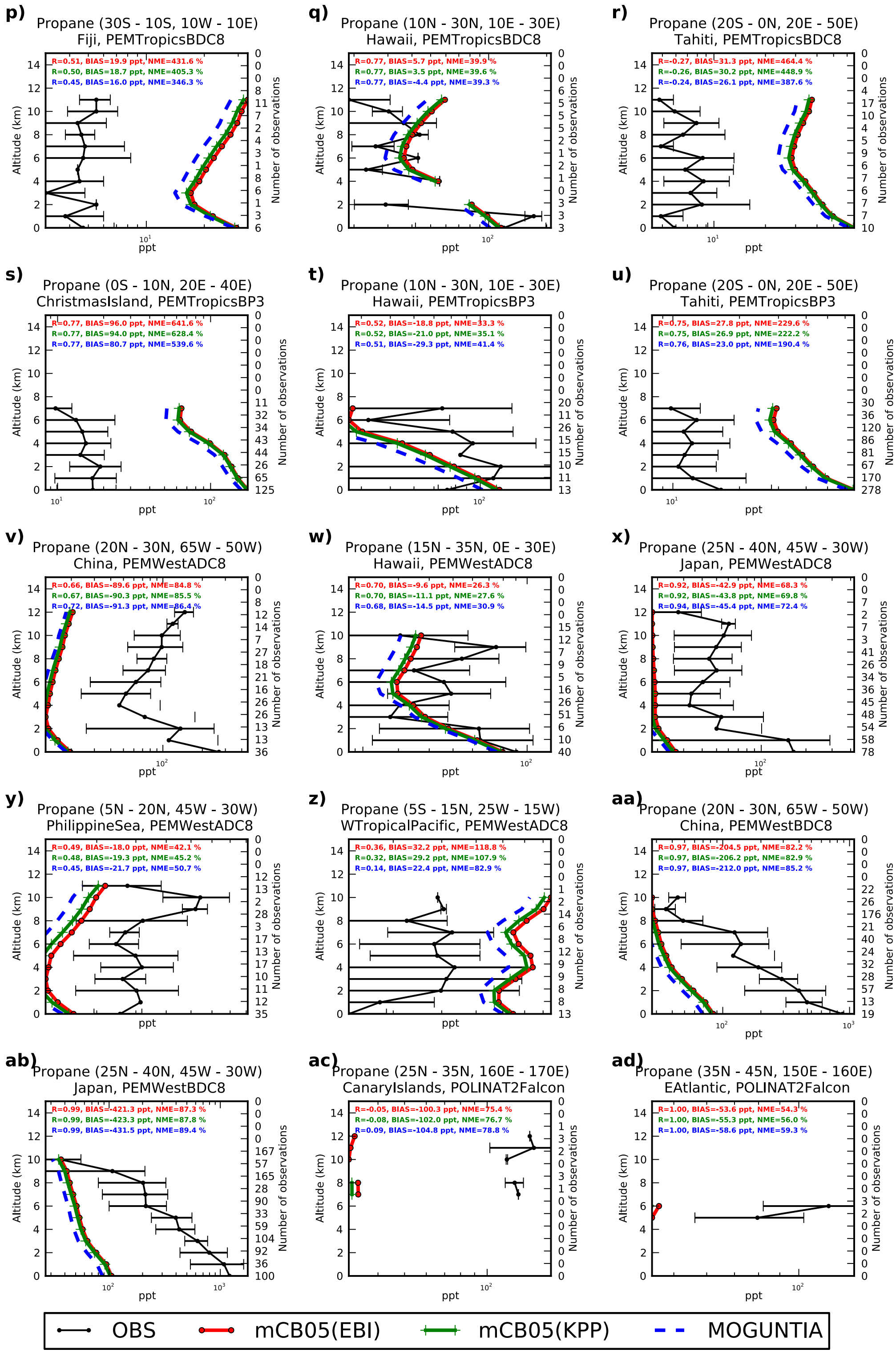
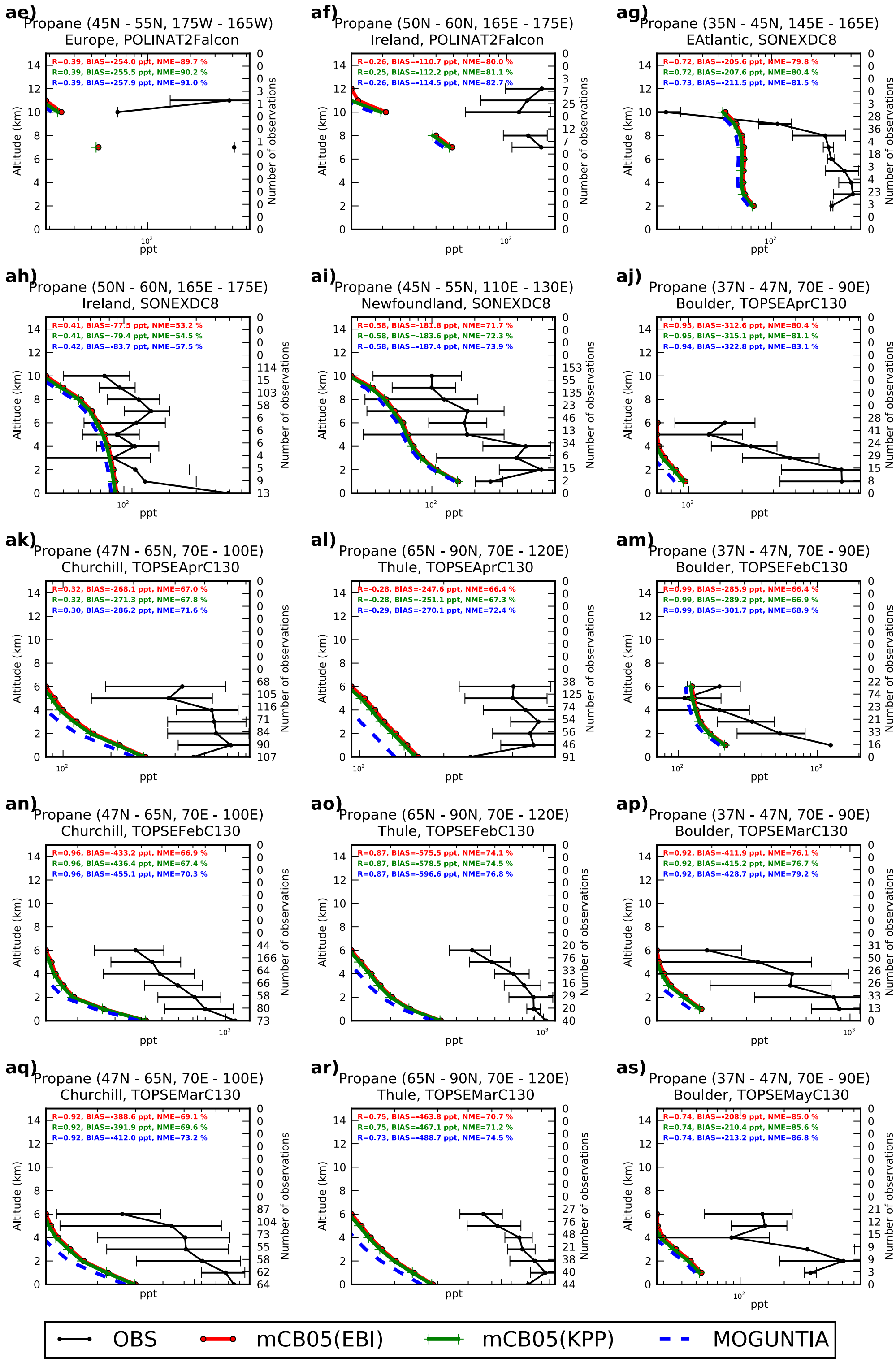


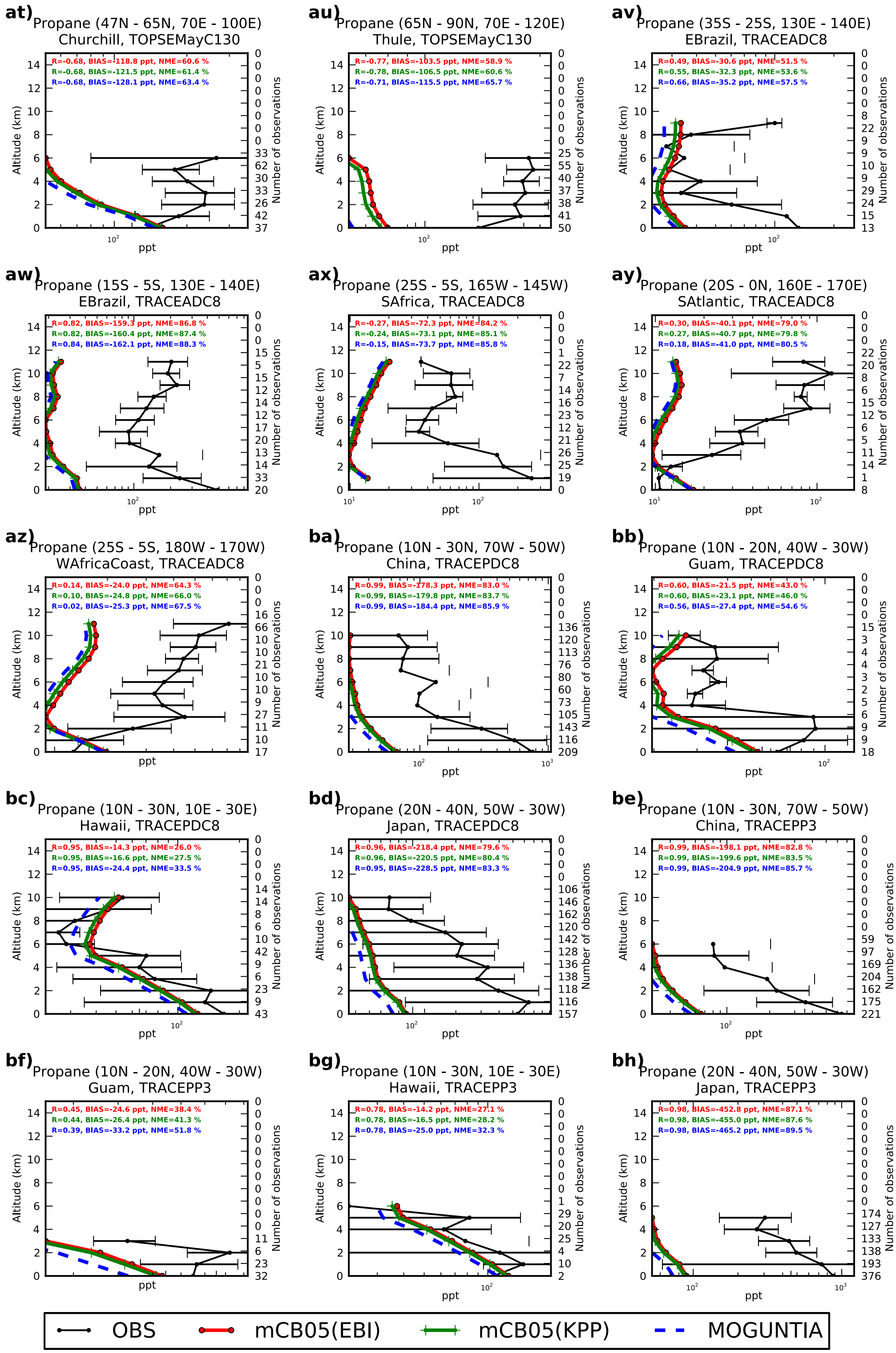
Figure S 7: Comparison of TM5-MP vertical profiles (in km) of C_2H_6 against aircraft observations (black line) in ppt with model results (red-line for mCB05(EBI), green-line for mCB05(KPP) and blue-line for MOGUNTIA), using co-located model output for 2006 sampled at the measurement times; error bars indicate the standard deviation. The numbers on the right vertical axis indicate the number of available measurements.


a) Propane (50N - 55N, 120E - 135E)
Labrador, ABLE3BElectra
R=0.22, BIAS=-33.7 ppt, NME=39.6 %
R=0.22, BIAS=-35.2 ppt, NME=41.3 %
R=0.22, BIAS=-40.5 ppt, NME=47.5 %
b) Propane (45N - 60N, 90E - 100E)
Ontario, ABLE3BElectra
R=0.81, BIAS=-18.6 ppt, NME=28.3 %
R=0.81, BIAS=-20.4 ppt, NME=28.6 %
R=0.81, BIAS=-25.1 ppt, NME=29.4 %
c) Propane (35N - 45N, 100E - 110E)
USECoast, ABLE3BElectra
R=0.94, BIAS=-209.9 ppt, NME=73.8 %
R=0.94, BIAS=-211.7 ppt, NME=74.4 %
R=0.94, BIAS=-216.2 ppt, NME=75.9 %
d) Propane (55S - 40S, 45W - 20W)
Tasmania, ACE1DC8
R=-0.66, BIAS=16.5 ppt, NME=147.2 %
R=-0.66, BIAS=15.8 ppt, NME=140.9 %
R=-0.67, BIAS=15.5 ppt, NME=138.2 %
e) Propane (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsADC8
R=-0.70, BIAS=69.8 ppt, NME=334.3 %
R=-0.70, BIAS=67.8 ppt, NME=324.4 %
R=-0.70, BIAS=57.9 ppt, NME=277.0 %
f) Propane (40S - 20S, 60E - 80E)
EasterIsland, PEMTropicsADC8
R=-0.09, BIAS=16.4 ppt, NME=76.2 %
R=-0.13, BIAS=14.3 ppt, NME=66.6 %
R=-0.33, BIAS=11.7 ppt, NME=54.2 %
g) Propane (30S - 10S, 10W - 10E)
Fiji, PEMTropicsADC8
R=0.39, BIAS=12.4 ppt, NME=44.5 %
R=0.37, BIAS=10.0 ppt, NME=36.0 %
R=0.07, BIAS=6.0 ppt, NME=21.5 %
h) Propane (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsADC8
R=-0.43, BIAS=37.7 ppt, NME=179.7 %
R=-0.44, BIAS=35.6 ppt, NME=169.9 %
R=-0.47, BIAS=29.9 ppt, NME=142.6 %
i) Propane (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsADC8
R=-0.55, BIAS=37.7 ppt, NME=162.6 %
R=-0.56, BIAS=35.7 ppt, NME=153.7 %
R=-0.57, BIAS=30.7 ppt, NME=132.2 %
j) Propane (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsAP3
R=0.07, BIAS=84.1 ppt, NME=506.8 %
R=0.07, BIAS=82.0 ppt, NME=494.4 %
R=0.08, BIAS=71.5 ppt, NME=430.8 %
k) Propane (40S - 20S, 60E - 80E)
EasterIsland, PEMTropicsAP3
R=0.18, BIAS=17.1 ppt, NME=84.5 %
R=0.15, BIAS=15.1 ppt, NME=74.6 %
R=0.04, BIAS=13.0 ppt, NME=64.2 %
l) Propane (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsAP3
R=0.06, BIAS=44.3 ppt, NME=279.8 %
R=0.06, BIAS=42.4 ppt, NME=268.3 %
R=0.06, BIAS=37.2 ppt, NME=235.5 %
m) Propane (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsAP3
R=-0.24, BIAS=43.9 ppt, NME=213.1 %
R=-0.24, BIAS=41.9 ppt, NME=203.7 %
R=-0.24, BIAS=37.4 ppt, NME=181.5 %
n) Propane (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsBDC8
R=-0.12, BIAS=85.7 ppt, NME=637.9 %
R=-0.12, BIAS=83.7 ppt, NME=622.7 %
R=-0.12, BIAS=70.8 ppt, NME=527.0 %
o) Propane (40S - 20S, 60E - 80E)
EasterIsland, PEMTropicsBDC8
R=-0.16, BIAS=13.4 ppt, NME=230.0 %
R=-0.23, BIAS=12.6 ppt, NME=216.1 %
R=-0.35, BIAS=11.4 ppt, NME=195.7 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


p) Propane (30S - 10S, 10W - 10E)
Fiji, PEMTropicsBDC8
R=0.51, BIAS=19.9 ppt, NME=431.6 %
R=0.50, BIAS=18.7 ppt, NME=405.3 %
R=0.45, BIAS=16.0 ppt, NME=346.3 %
q) Propane (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsBDC8
R=0.77, BIAS=5.7 ppt, NME=39.9 %
R=0.77, BIAS=3.5 ppt, NME=39.6 %
R=0.77, BIAS=-4.4 ppt, NME=39.3 %
r) Propane (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsBDC8
R=-0.27, BIAS=31.3 ppt, NME=464.4 %
R=-0.26, BIAS=30.2 ppt, NME=448.9 %
R=-0.24, BIAS=26.1 ppt, NME=387.6 %
s) Propane (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsBP3
R=0.77, BIAS=96.0 ppt, NME=641.6 %
R=0.77, BIAS=94.0 ppt, NME=628.4 %
R=0.77, BIAS=80.7 ppt, NME=539.6 %
t) Propane (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsBP3
R=0.52, BIAS=-18.8 ppt, NME=33.3 %
R=0.52, BIAS=-21.0 ppt, NME=35.1 %
R=0.51, BIAS=-29.3 ppt, NME=41.4 %
u) Propane (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsBP3
R=0.75, BIAS=27.8 ppt, NME=229.6 %
R=0.75, BIAS=26.9 ppt, NME=222.2 %
R=0.76, BIAS=23.0 ppt, NME=190.4 %
v) Propane (20N - 30N, 65W - 50W)
China, PEMWestADC8
R=0.66, BIAS=-89.6 ppt, NME=84.8 %
R=0.67, BIAS=-90.3 ppt, NME=85.5 %
R=0.72, BIAS=-91.3 ppt, NME=86.4 %
w) Propane (15N - 35N, 0E - 30E)
Hawaii, PEMWestADC8
R=0.70, BIAS=-9.6 ppt, NME=26.3 %
R=0.70, BIAS=-11.1 ppt, NME=27.6 %
R=0.68, BIAS=-14.5 ppt, NME=30.9 %
x) Propane (25N - 40N, 45W - 30W)
Japan, PEMWestADC8
R=0.92, BIAS=-42.9 ppt, NME=68.3 %
R=0.92, BIAS=-43.8 ppt, NME=69.8 %
R=0.94, BIAS=-45.4 ppt, NME=72.4 %
y) Propane (5N - 20N, 45W - 30W)
PhilippineSea, PEMWestADC8
R=0.49, BIAS=-18.0 ppt, NME=42.1 %
R=0.48, BIAS=-19.3 ppt, NME=45.2 %
R=0.45, BIAS=-21.7 ppt, NME=50.7 %
z) Propane (5S - 15N, 25W - 15W)
WTropicalPacific, PEMWestADC8
R=0.36, BIAS=32.2 ppt, NME=118.8 %
R=0.32, BIAS=29.2 ppt, NME=107.9 %
R=0.14, BIAS=22.4 ppt, NME=82.9 %
aa) Propane (20N - 30N, 65W - 50W)
China, PEMWestBDC8
R=0.97, BIAS=-204.5 ppt, NME=82.2 %
R=0.97, BIAS=-206.2 ppt, NME=82.9 %
R=0.97, BIAS=-212.0 ppt, NME=85.2 %
ab) Propane (25N - 40N, 45W - 30W)
Japan, PEMWestBDC8
R=0.99, BIAS=-421.3 ppt, NME=87.3 %
R=0.99, BIAS=-423.3 ppt, NME=87.8 %
R=0.99, BIAS=-431.5 ppt, NME=89.4 %
ac) Propane (25N - 35N, 160E - 170E)
CanaryIslands, POLINAT2Falcon
R=-0.05, BIAS=-100.3 ppt, NME=75.4 %
R=-0.08, BIAS=-102.0 ppt, NME=76.7 %
R=0.09, BIAS=-104.8 ppt, NME=78.8 %
ad) Propane (35N - 45N, 150E - 160E)
EAtlantic, POLINAT2Falcon
R=1.00, BIAS=-53.6 ppt, NME=54.3 %
R=1.00, BIAS=-55.3 ppt, NME=56.0 %
R=1.00, BIAS=-58.6 ppt, NME=59.3 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA



ae)
Propane (45N - 55N, 175W - 165W)
Europe, POLINAT2Falcon
R=0.39, BIAS=-254.0 ppt, NME=89.7 %
R=0.39, BIAS=-255.5 ppt, NME=90.2 %
R=0.39, BIAS=-257.9 ppt, NME=91.0 %
af)
Propane (50N - 60N, 165E - 175E)
Ireland, POLINAT2Falcon
R=0.26, BIAS=-110.7 ppt, NME=80.0 %
R=0.25, BIAS=-112.2 ppt, NME=81.1 %
R=0.26, BIAS=-114.5 ppt, NME=82.7 %
ag)
Propane (35N - 45N, 145E - 165E)
EAtlantic, SONEXDC8
R=0.72, BIAS=-205.6 ppt, NME=79.8 %
R=0.72, BIAS=-207.6 ppt, NME=80.4 %
R=0.73, BIAS=-211.5 ppt, NME=81.5 %
ah)
Propane (50N - 60N, 165E - 175E)
Ireland, SONEXDC8
R=0.41, BIAS=-77.5 ppt, NME=53.2 %
R=0.41, BIAS=-79.4 ppt, NME=54.5 %
R=0.42, BIAS=-83.7 ppt, NME=57.5 %
ai)
Propane (45N - 55N, 110E - 130E)
Newfoundland, SONEXDC8
R=0.58, BIAS=-181.8 ppt, NME=71.7 %
R=0.58, BIAS=-183.6 ppt, NME=72.3 %
R=0.58, BIAS=-187.4 ppt, NME=73.9 %
aj)
Propane (37N - 47N, 70E - 90E)
Boulder, TOPSEAprC130
R=0.95, BIAS=-312.6 ppt, NME=80.4 %
R=0.95, BIAS=-315.1 ppt, NME=81.1 %
R=0.94, BIAS=-322.8 ppt, NME=83.1 %
ak)
Propane (47N - 65N, 70E - 100E)
Churchill, TOPSEAprC130
R=0.32, BIAS=-268.1 ppt, NME=67.0 %
R=0.32, BIAS=-271.3 ppt, NME=67.8 %
R=0.30, BIAS=-286.2 ppt, NME=71.6 %
al)
Propane (65N - 90N, 70E - 120E)
Thule, TOPSEAprC130
R=-0.28, BIAS=-247.6 ppt, NME=66.4 %
R=-0.28, BIAS=-251.1 ppt, NME=67.3 %
R=-0.29, BIAS=-270.1 ppt, NME=72.4 %
am)
Propane (37N - 47N, 70E - 90E)
Boulder, TOPSEFebC130
R=0.99, BIAS=-285.9 ppt, NME=66.4 %
R=0.99, BIAS=-289.2 ppt, NME=66.9 %
R=0.99, BIAS=-301.7 ppt, NME=68.9 %
an)
Propane (47N - 65N, 70E - 100E)
Churchill, TOPSEFebC130
R=0.96, BIAS=-433.2 ppt, NME=66.9 %
R=0.96, BIAS=-436.4 ppt, NME=67.4 %
R=0.96, BIAS=-455.1 ppt, NME=70.3 %
ao)
Propane (65N - 90N, 70E - 120E)
Thule, TOPSEFebC130
R=0.87, BIAS=-575.5 ppt, NME=74.1 %
R=0.87, BIAS=-578.5 ppt, NME=74.5 %
R=0.87, BIAS=-596.6 ppt, NME=76.8 %
ap)
Propane (37N - 47N, 70E - 90E)
Boulder, TOPSEMarC130
R=0.92, BIAS=-411.9 ppt, NME=76.1 %
R=0.92, BIAS=-415.2 ppt, NME=76.7 %
R=0.92, BIAS=-428.7 ppt, NME=79.2 %
aq)
Propane (47N - 65N, 70E - 100E)
Churchill, TOPSEMarC130
R=0.92, BIAS=-388.6 ppt, NME=69.1 %
R=0.92, BIAS=-391.9 ppt, NME=69.6 %
R=0.92, BIAS=-412.0 ppt, NME=73.2 %
ar)
Propane (65N - 90N, 70E - 120E)
Thule, TOPSEMarC130
R=0.75, BIAS=-463.8 ppt, NME=70.7 %
R=0.75, BIAS=-467.1 ppt, NME=71.2 %
R=0.73, BIAS=-488.7 ppt, NME=74.5 %
as)
Propane (37N - 47N, 70E - 90E)
Boulder, TOPSEMayC130
R=0.74, BIAS=-208.9 ppt, NME=85.0 %
R=0.74, BIAS=-210.4 ppt, NME=85.6 %
R=0.74, BIAS=-213.2 ppt, NME=86.8 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


at) Propane (47N - 65N, 70E - 100E)
Churchill, TOPSEMayC130
R=-0.68, BIAS=-118.8 ppt, NME=60.6 %
R=-0.68, BIAS=-121.5 ppt, NME=61.4 %
R=-0.68, BIAS=-128.1 ppt, NME=63.4 %
au) Propane (65N - 90N, 70E - 120E)
Thule, TOPSEMayC130
R=-0.77, BIAS=-103.5 ppt, NME=58.9 %
R=-0.78, BIAS=-106.5 ppt, NME=60.6 %
R=-0.71, BIAS=-115.5 ppt, NME=65.7 %
av) Propane (35S - 25S, 130E - 140E)
EBrazil, TRACEADC8
R=0.49, BIAS=-30.6 ppt, NME=51.5 %
R=0.55, BIAS=-32.3 ppt, NME=53.6 %
R=0.66, BIAS=-35.2 ppt, NME=57.5 %
aw) Propane (15S - 5S, 130E - 140E)
EBrazil, TRACEADC8
R=0.82, BIAS=-159.3 ppt, NME=86.8 %
R=0.82, BIAS=-160.4 ppt, NME=87.4 %
R=0.84, BIAS=-162.1 ppt, NME=88.3 %
ax) Propane (25S - 5S, 165W - 145W)
SAfrica, TRACEADC8
R=-0.27, BIAS=-72.3 ppt, NME=84.2 %
R=-0.24, BIAS=-73.1 ppt, NME=85.1 %
R=-0.15, BIAS=-73.7 ppt, NME=85.8 %
ay) Propane (20S - 0N, 160E - 170E)
SAtlantic, TRACEADC8
R=0.30, BIAS=-40.1 ppt, NME=79.0 %
R=0.27, BIAS=-40.7 ppt, NME=79.8 %
R=0.18, BIAS=-41.0 ppt, NME=80.5 %
az) Propane (25S - 5S, 180W - 170W)
WAfricaCoast, TRACEADC8
R=0.14, BIAS=-24.0 ppt, NME=64.3 %
R=0.10, BIAS=-24.8 ppt, NME=66.0 %
R=0.02, BIAS=-25.3 ppt, NME=67.5 %
ba) Propane (10N - 30N, 70W - 50W)
China, TRACEPDC8
R=0.99, BIAS=-178.3 ppt, NME=83.0 %
R=0.99, BIAS=-179.8 ppt, NME=83.7 %
R=0.99, BIAS=-184.4 ppt, NME=85.9 %
bb) Propane (10N - 20N, 40W - 30W)
Guam, TRACEPDC8
R=0.60, BIAS=-21.5 ppt, NME=43.0 %
R=0.60, BIAS=-23.1 ppt, NME=46.0 %
R=0.56, BIAS=-27.4 ppt, NME=54.6 %
bc) Propane (10N - 30N, 10E - 30E)
Hawaii, TRACEPDC8
R=0.95, BIAS=-14.3 ppt, NME=26.0 %
R=0.95, BIAS=-16.6 ppt, NME=27.5 %
R=0.95, BIAS=-24.4 ppt, NME=33.5 %
bd) Propane (20N - 40N, 50W - 30W)
Japan, TRACEPDC8
R=0.96, BIAS=-218.4 ppt, NME=79.6 %
R=0.96, BIAS=-220.5 ppt, NME=80.4 %
R=0.95, BIAS=-228.5 ppt, NME=83.3 %
be) Propane (10N - 30N, 70W - 50W)
China, TRACEPP3
R=0.99, BIAS=-198.1 ppt, NME=82.8 %
R=0.99, BIAS=-199.6 ppt, NME=83.5 %
R=0.99, BIAS=-204.9 ppt, NME=85.7 %
bf) Propane (10N - 20N, 40W - 30W)
Guam, TRACEPP3
R=0.45, BIAS=-24.6 ppt, NME=38.4 %
R=0.44, BIAS=-26.4 ppt, NME=41.3 %
R=0.39, BIAS=-33.2 ppt, NME=51.8 %
bg) Propane (10N - 30N, 10E - 30E)
Hawaii, TRACEPP3
R=0.78, BIAS=-14.2 ppt, NME=27.1 %
R=0.78, BIAS=-16.5 ppt, NME=28.2 %
R=0.78, BIAS=-25.0 ppt, NME=32.3 %
bh) Propane (20N - 40N, 50W - 30W)
Japan, TRACEPP3
R=0.98, BIAS=-452.8 ppt, NME=87.1 %
R=0.98, BIAS=-455.0 ppt, NME=87.6 %
R=0.98, BIAS=-465.2 ppt, NME=89.5 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

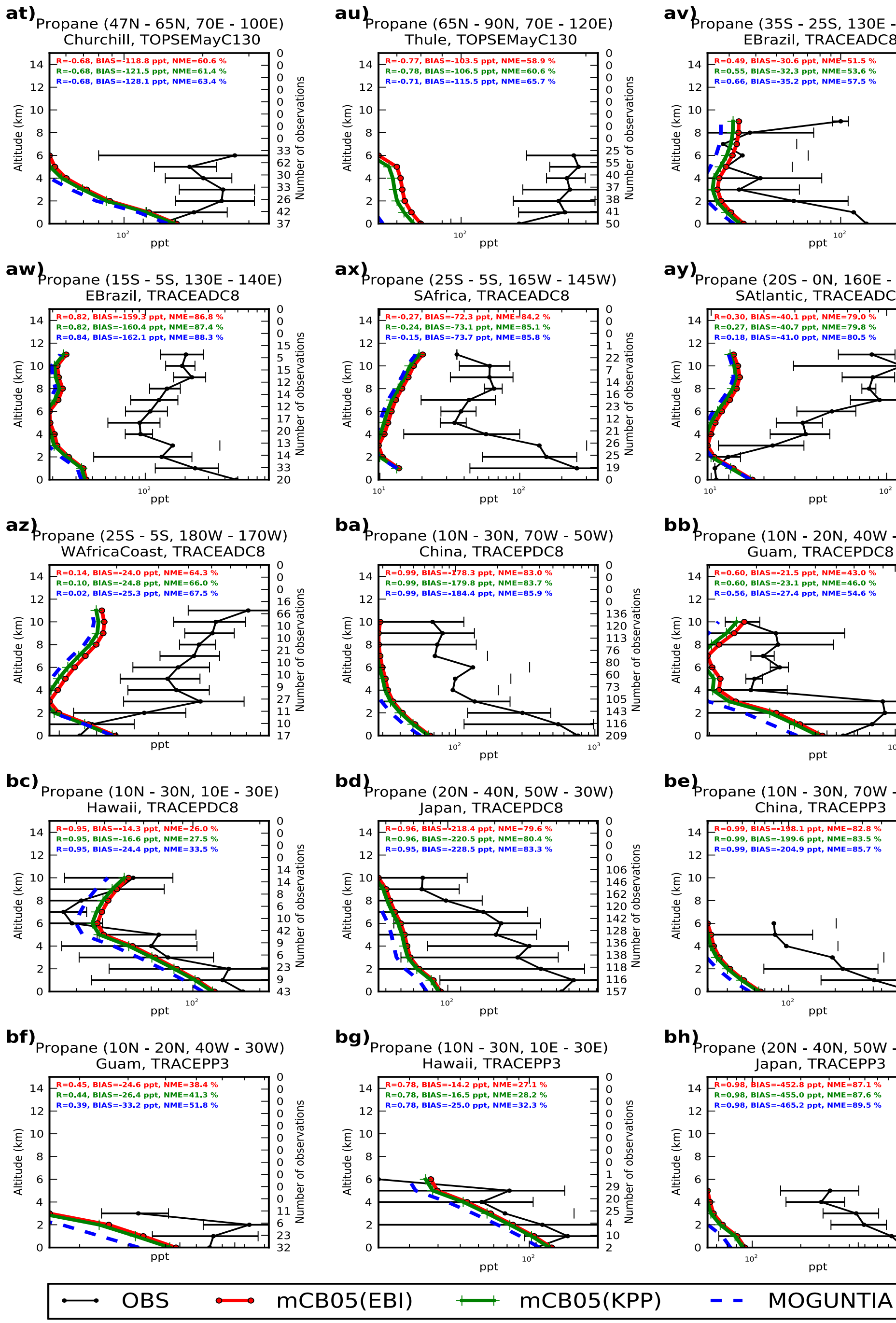
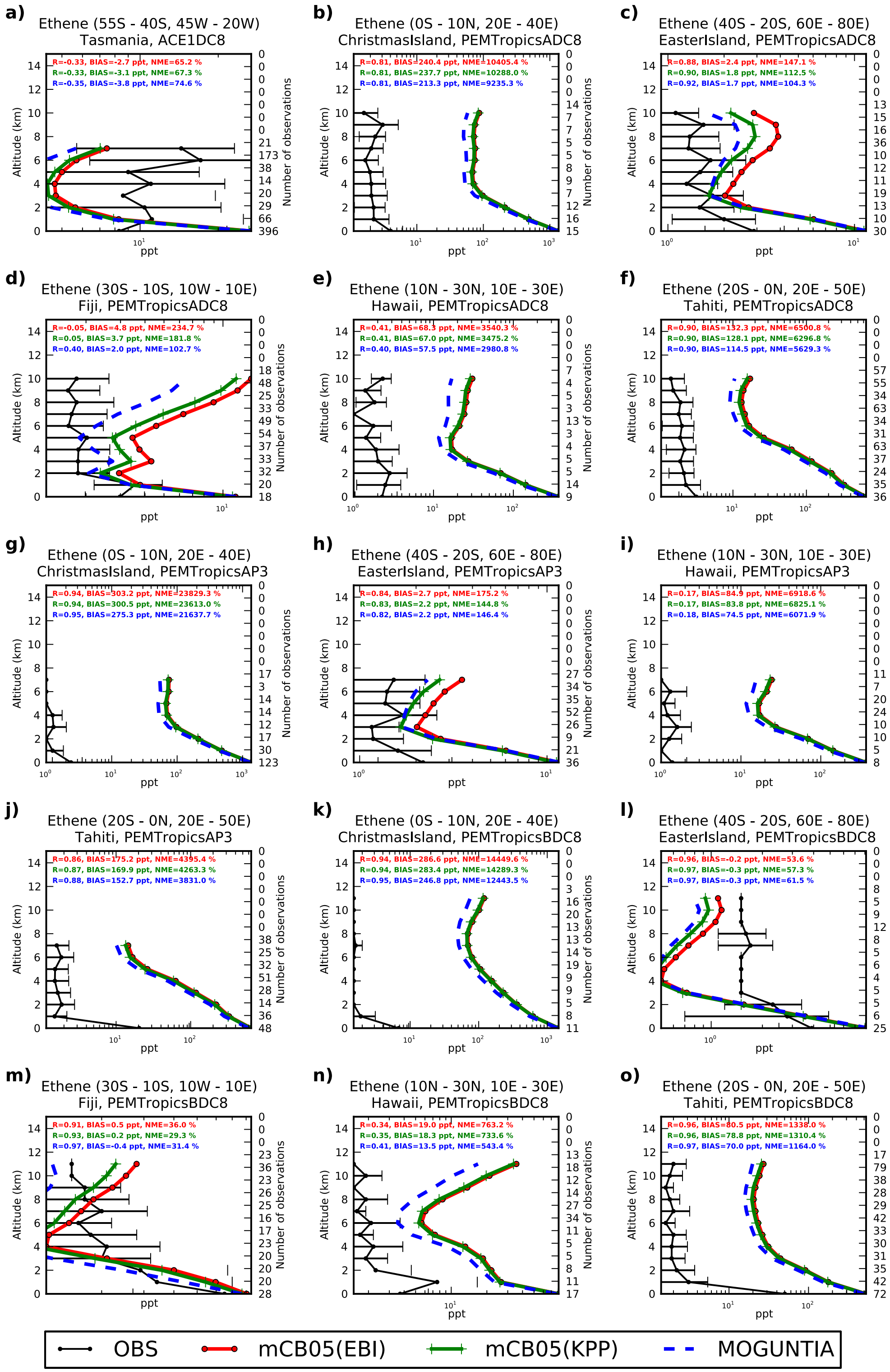
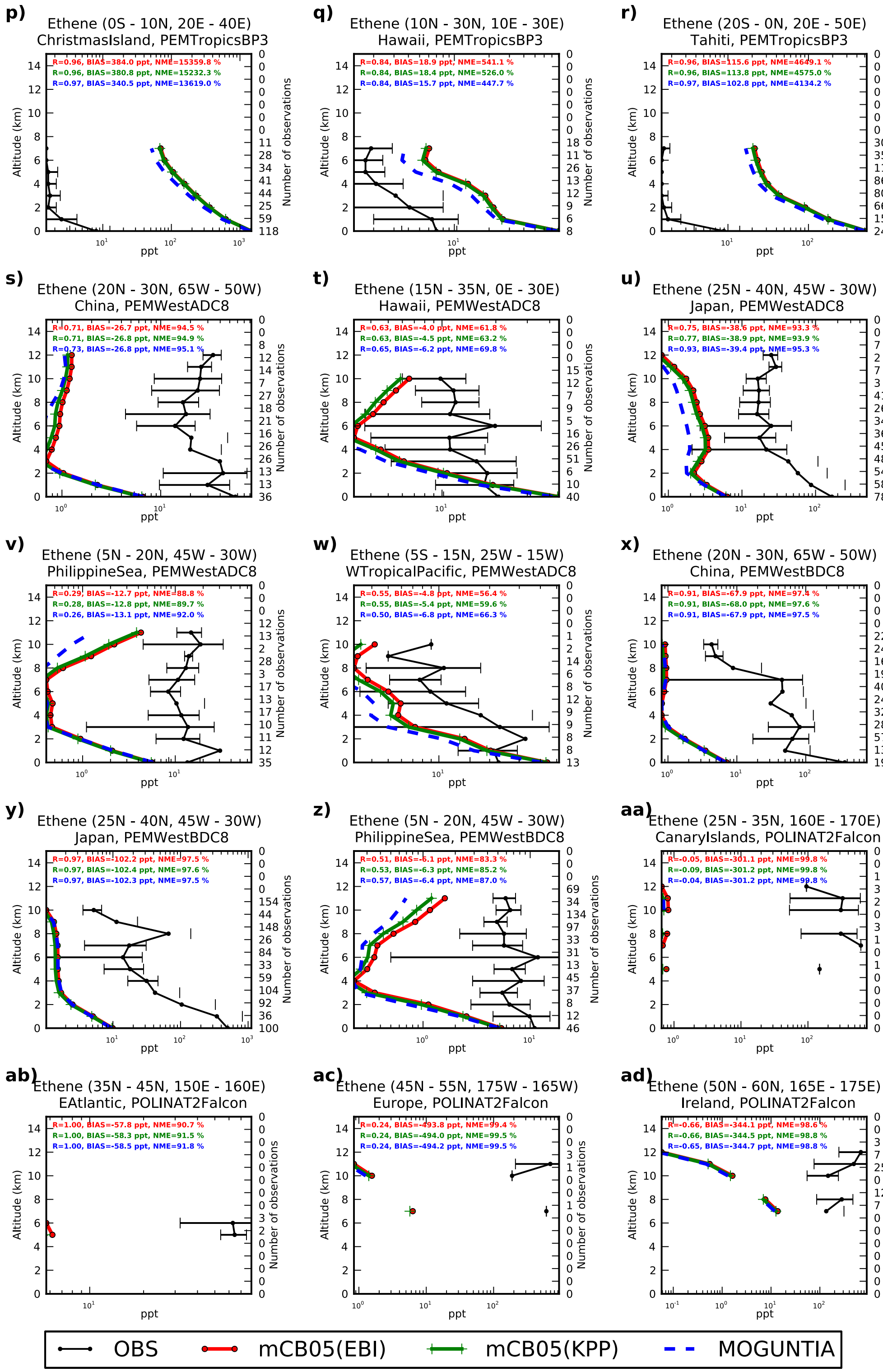
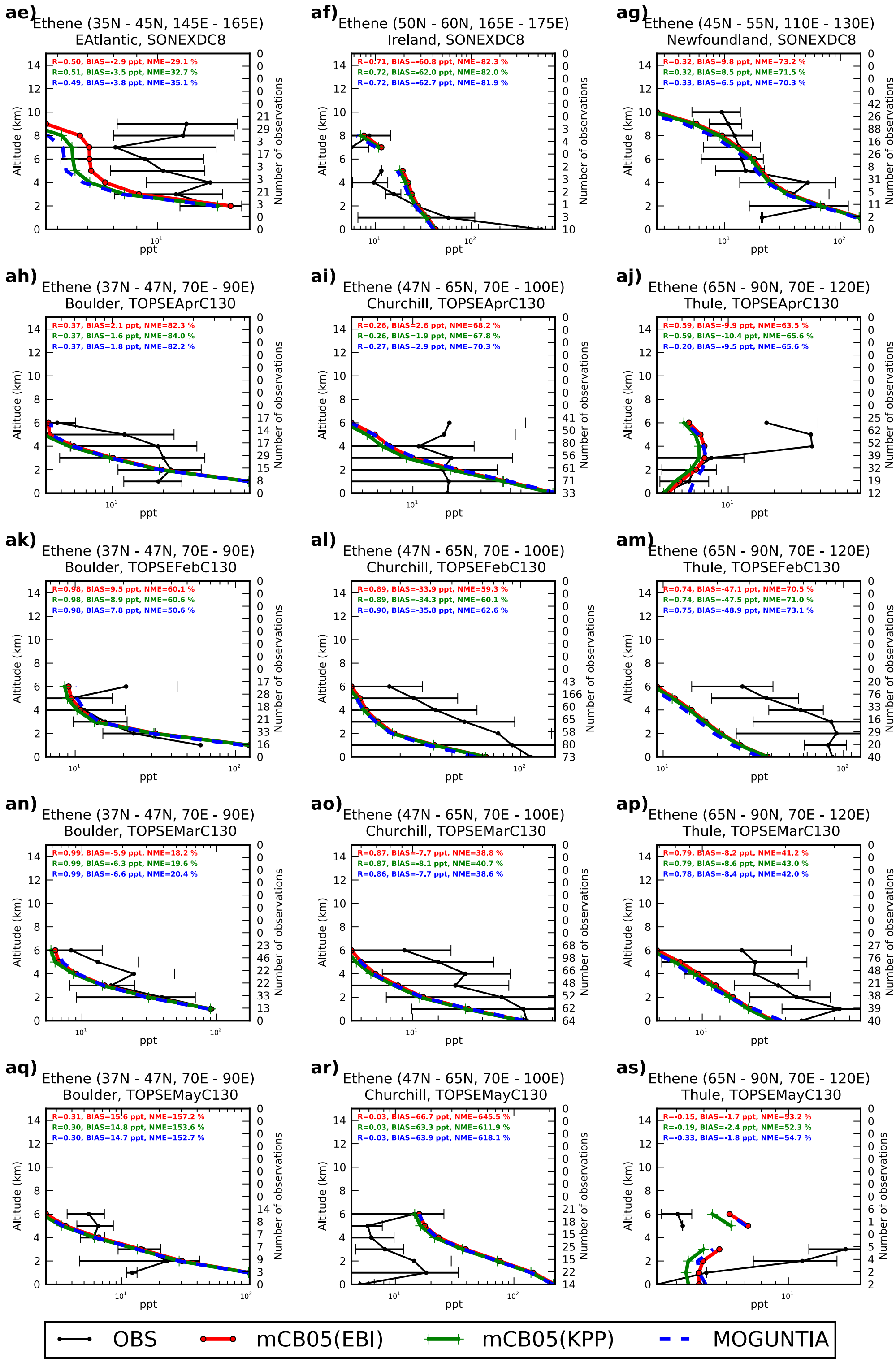


Figure S 8: Comparison of TM5-MP vertical profiles (in km) of C_3H_8 against aircraft observations (black line) in ppt, with model results (red-line for mCB05(EBI), green-line for mCB05(KPP) and blue-line for MOGUNTIA), using co-located model output for 2006 sampled at the measurement times; error bars indicate the standard deviation. The numbers on the right vertical axis indicate the number of available measurements.


a) Ethene (55S - 40S, 45W - 20W)
Tasmania, ACE1DC8
R=-0.33, BIAS=-2.7 ppt, NME=65.2 %
R=-0.33, BIAS=-3.1 ppt, NME=67.3 %
R=-0.35, BIAS=-3.8 ppt, NME=74.6 %
b) Ethene (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsADC8
R=0.81, BIAS=240.4 ppt, NME=10405.4 %
R=0.81, BIAS=237.7 ppt, NME=10288.0 %
R=0.81, BIAS=213.3 ppt, NME=9235.3 %
c) Ethene (40S - 20S, 60E - 80E)
EasterIsland, PEMTropicsADC8
R=0.88, BIAS=2.4 ppt, NME=147.1 %
R=0.90, BIAS=1.8 ppt, NME=112.5 %
R=0.92, BIAS=1.7 ppt, NME=104.3 %
d) Ethene (30S - 10S, 10W - 10E)
Fiji, PEMTropicsADC8
R=-0.05, BIAS=4.8 ppt, NME=234.7 %
R=0.05, BIAS=3.7 ppt, NME=181.8 %
R=0.40, BIAS=2.0 ppt, NME=102.7 %
e) Ethene (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsADC8
R=0.41, BIAS=68.3 ppt, NME=3540.3 %
R=0.41, BIAS=67.0 ppt, NME=3475.2 %
R=0.40, BIAS=57.5 ppt, NME=2980.8 %
f) Ethene (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsADC8
R=0.90, BIAS=132.3 ppt, NME=6500.8 %
R=0.90, BIAS=128.1 ppt, NME=6296.8 %
R=0.90, BIAS=114.5 ppt, NME=5629.3 %
g) Ethene (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsAP3
R=0.94, BIAS=303.2 ppt, NME=23829.3 %
R=0.94, BIAS=300.5 ppt, NME=23613.0 %
R=0.95, BIAS=275.3 ppt, NME=21637.7 %
h) Ethene (40S - 20S, 60E - 80E)
EasterIsland, PEMTropicsAP3
R=0.84, BIAS=2.7 ppt, NME=175.2 %
R=0.83, BIAS=2.2 ppt, NME=144.8 %
R=0.82, BIAS=2.2 ppt, NME=146.4 %
i) Ethene (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsAP3
R=0.17, BIAS=84.9 ppt, NME=6918.6 %
R=0.17, BIAS=83.8 ppt, NME=6825.1 %
R=0.18, BIAS=74.5 ppt, NME=6071.9 %
j) Ethene (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsAP3
R=0.86, BIAS=175.2 ppt, NME=4395.4 %
R=0.87, BIAS=169.9 ppt, NME=4263.3 %
R=0.88, BIAS=152.7 ppt, NME=3831.0 %
k) Ethene (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsBDC8
R=0.94, BIAS=286.6 ppt, NME=14449.6 %
R=0.94, BIAS=283.4 ppt, NME=14289.3 %
R=0.95, BIAS=246.8 ppt, NME=12443.5 %
l) Ethene (40S - 20S, 60E - 80E)
EasterIsland, PEMTropicsBDC8
R=0.96, BIAS=-0.2 ppt, NME=53.6 %
R=0.97, BIAS=-0.3 ppt, NME=57.3 %
R=0.97, BIAS=-0.3 ppt, NME=61.5 %
m) Ethene (30S - 10S, 10W - 10E)
Fiji, PEMTropicsBDC8
R=0.91, BIAS=0.5 ppt, NME=36.0 %
R=0.93, BIAS=0.2 ppt, NME=29.3 %
R=0.97, BIAS=-0.4 ppt, NME=31.4 %
n) Ethene (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsBDC8
R=0.34, BIAS=19.0 ppt, NME=763.2 %
R=0.35, BIAS=18.3 ppt, NME=733.6 %
R=0.41, BIAS=13.5 ppt, NME=543.4 %
o) Ethene (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsBDC8
R=0.96, BIAS=80.5 ppt, NME=1338.0 %
R=0.96, BIAS=78.8 ppt, NME=1310.4 %
R=0.97, BIAS=70.0 ppt, NME=1164.0 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA



p)
Ethene (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsBP3
R=0.96, BIAS=384.0 ppt, NME=15359.8 %
R=0.96, BIAS=380.8 ppt, NME=15232.3 %
R=0.97, BIAS=340.5 ppt, NME=13619.0 %
q)
Ethene (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsBP3
R=0.84, BIAS=18.9 ppt, NME=541.1 %
R=0.84, BIAS=18.4 ppt, NME=526.0 %
R=0.84, BIAS=15.7 ppt, NME=447.7 %
r)
Ethene (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsBP3
R=0.96, BIAS=115.6 ppt, NME=4649.1 %
R=0.96, BIAS=113.8 ppt, NME=4575.0 %
R=0.97, BIAS=102.8 ppt, NME=4134.2 %
s)
Ethene (20N - 30N, 65W - 50W)
China, PEMWestADC8
R=0.71, BIAS=-26.7 ppt, NME=94.5 %
R=0.71, BIAS=-26.8 ppt, NME=94.9 %
R=0.73, BIAS=-26.8 ppt, NME=95.1 %
t)
Ethene (15N - 35N, 0E - 30E)
Hawaii, PEMWestADC8
R=0.63, BIAS=-4.0 ppt, NME=61.8 %
R=0.63, BIAS=-4.5 ppt, NME=63.2 %
R=0.65, BIAS=-6.2 ppt, NME=69.8 %
u)
Ethene (25N - 40N, 45W - 30W)
Japan, PEMWestADC8
R=0.75, BIAS=-38.6 ppt, NME=93.3 %
R=0.77, BIAS=-38.9 ppt, NME=93.9 %
R=0.93, BIAS=-39.4 ppt, NME=95.3 %
v)
Ethene (5N - 20N, 45W - 30W)
PhilippineSea, PEMWestADC8
R=0.29, BIAS=-12.7 ppt, NME=88.8 %
R=0.28, BIAS=-12.8 ppt, NME=89.7 %
R=0.26, BIAS=-13.1 ppt, NME=92.0 %
w)
Ethene (5S - 15N, 25W - 15W)
WTropicalPacific, PEMWestADC8
R=0.55, BIAS=-4.8 ppt, NME=56.4 %
R=0.55, BIAS=-5.4 ppt, NME=59.6 %
R=0.50, BIAS=-6.8 ppt, NME=66.3 %
x)
Ethene (20N - 30N, 65W - 50W)
China, PEMWestBDC8
R=0.91, BIAS=-67.9 ppt, NME=97.4 %
R=0.91, BIAS=-68.0 ppt, NME=97.6 %
R=0.91, BIAS=-67.9 ppt, NME=97.5 %
y)
Ethene (25N - 40N, 45W - 30W)
Japan, PEMWestBDC8
R=0.97, BIAS=-102.2 ppt, NME=97.5 %
R=0.97, BIAS=-102.4 ppt, NME=97.6 %
R=0.97, BIAS=-102.3 ppt, NME=97.5 %
z)
Ethene (5N - 20N, 45W - 30W)
PhilippineSea, PEMWestBDC8
R=0.51, BIAS=-6.1 ppt, NME=83.3 %
R=0.53, BIAS=-6.3 ppt, NME=85.2 %
R=0.57, BIAS=-6.4 ppt, NME=87.0 %
aa)
Ethene (25N - 35N, 160E - 170E)
CanaryIslands, POLINAT2Falcon
R=-0.05, BIAS=-301.1 ppt, NME=99.8 %
R=-0.09, BIAS=-301.2 ppt, NME=99.8 %
R=-0.04, BIAS=-301.2 ppt, NME=99.8 %
ab)
Ethene (35N - 45N, 150E - 160E)
EAtlantic, POLINAT2Falcon
R=1.00, BIAS=-57.8 ppt, NME=90.7 %
R=1.00, BIAS=-58.3 ppt, NME=91.5 %
R=1.00, BIAS=-58.5 ppt, NME=91.8 %
ac)
Ethene (45N - 55N, 175W - 165W)
Europe, POLINAT2Falcon
R=0.24, BIAS=-493.8 ppt, NME=99.4 %
R=0.24, BIAS=-494.0 ppt, NME=99.5 %
R=0.24, BIAS=-494.2 ppt, NME=99.5 %
ad)
Ethene (50N - 60N, 165E - 175E)
Ireland, POLINAT2Falcon
R=-0.66, BIAS=-344.1 ppt, NME=98.6 %
R=-0.66, BIAS=-344.5 ppt, NME=98.8 %
R=-0.65, BIAS=-344.7 ppt, NME=98.8 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


ae) Ethene (35N - 45N, 145E - 165E)
EAtlantic, SONEXDC8
R=0.50, BIAS=-2.9 ppt, NME=29.1 %
R=0.51, BIAS=-3.5 ppt, NME=32.7 %
R=0.49, BIAS=-3.8 ppt, NME=35.1 %
af) Ethene (50N - 60N, 165E - 175E)
Ireland, SONEXDC8
R=0.71, BIAS=-60.8 ppt, NME=82.3 %
R=0.72, BIAS=-62.0 ppt, NME=82.0 %
R=0.72, BIAS=-62.7 ppt, NME=81.9 %
ag) Ethene (45N - 55N, 110E - 130E)
Newfoundland, SONEXDC8
R=0.32, BIAS=9.8 ppt, NME=73.2 %
R=0.32, BIAS=8.5 ppt, NME=71.5 %
R=0.33, BIAS=6.5 ppt, NME=70.3 %
ah) Ethene (37N - 47N, 70E - 90E)
Boulder, TOPSEAprC130
R=0.37, BIAS=2.1 ppt, NME=82.3 %
R=0.37, BIAS=1.6 ppt, NME=84.0 %
R=0.37, BIAS=1.8 ppt, NME=82.2 %
ai) Ethene (47N - 65N, 70E - 100E)
Churchill, TOPSEAprC130
R=0.26, BIAS=2.6 ppt, NME=68.2 %
R=0.26, BIAS=1.9 ppt, NME=67.8 %
R=0.27, BIAS=2.9 ppt, NME=70.3 %
aj) Ethene (65N - 90N, 70E - 120E)
Thule, TOPSEAprC130
R=0.59, BIAS=-9.9 ppt, NME=63.5 %
R=0.59, BIAS=-10.4 ppt, NME=65.6 %
R=0.20, BIAS=-9.5 ppt, NME=65.6 %
ak) Ethene (37N - 47N, 70E - 90E)
Boulder, TOPSEFebC130
R=0.98, BIAS=9.5 ppt, NME=60.1 %
R=0.98, BIAS=8.9 ppt, NME=60.6 %
R=0.98, BIAS=7.8 ppt, NME=50.6 %
al) Ethene (47N - 65N, 70E - 100E)
Churchill, TOPSEFebC130
R=0.89, BIAS=-33.9 ppt, NME=59.3 %
R=0.89, BIAS=-34.3 ppt, NME=60.1 %
R=0.90, BIAS=-35.8 ppt, NME=62.6 %
am) Ethene (65N - 90N, 70E - 120E)
Thule, TOPSEFebC130
R=0.74, BIAS=-47.1 ppt, NME=70.5 %
R=0.74, BIAS=-47.5 ppt, NME=71.0 %
R=0.75, BIAS=-48.9 ppt, NME=73.1 %
an) Ethene (37N - 47N, 70E - 90E)
Boulder, TOPSEMarC130
R=0.99, BIAS=-5.9 ppt, NME=18.2 %
R=0.99, BIAS=-6.3 ppt, NME=19.6 %
R=0.99, BIAS=-6.6 ppt, NME=20.4 %
ao) Ethene (47N - 65N, 70E - 100E)
Churchill, TOPSEMarC130
R=0.87, BIAS=-7.7 ppt, NME=38.8 %
R=0.87, BIAS=-8.1 ppt, NME=40.7 %
R=0.86, BIAS=-7.7 ppt, NME=38.6 %
ap) Ethene (65N - 90N, 70E - 120E)
Thule, TOPSEMarC130
R=0.79, BIAS=-8.2 ppt, NME=41.2 %
R=0.79, BIAS=-8.6 ppt, NME=43.0 %
R=0.78, BIAS=-8.4 ppt, NME=42.0 %
aq) Ethene (37N - 47N, 70E - 90E)
Boulder, TOPSEMayC130
R=0.31, BIAS=15.6 ppt, NME=157.2 %
R=0.30, BIAS=14.8 ppt, NME=153.6 %
R=0.30, BIAS=14.7 ppt, NME=152.7 %
ar) Ethene (47N - 65N, 70E - 100E)
Churchill, TOPSEMayC130
R=0.03, BIAS=66.7 ppt, NME=645.5 %
R=0.03, BIAS=63.3 ppt, NME=611.9 %
R=0.03, BIAS=63.9 ppt, NME=618.1 %
as) Ethene (65N - 90N, 70E - 120E)
Thule, TOPSEMayC130
R=-0.15, BIAS=-1.7 ppt, NME=53.2 %
R=-0.19, BIAS=-2.4 ppt, NME=52.3 %
R=-0.33, BIAS=-1.8 ppt, NME=54.7 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

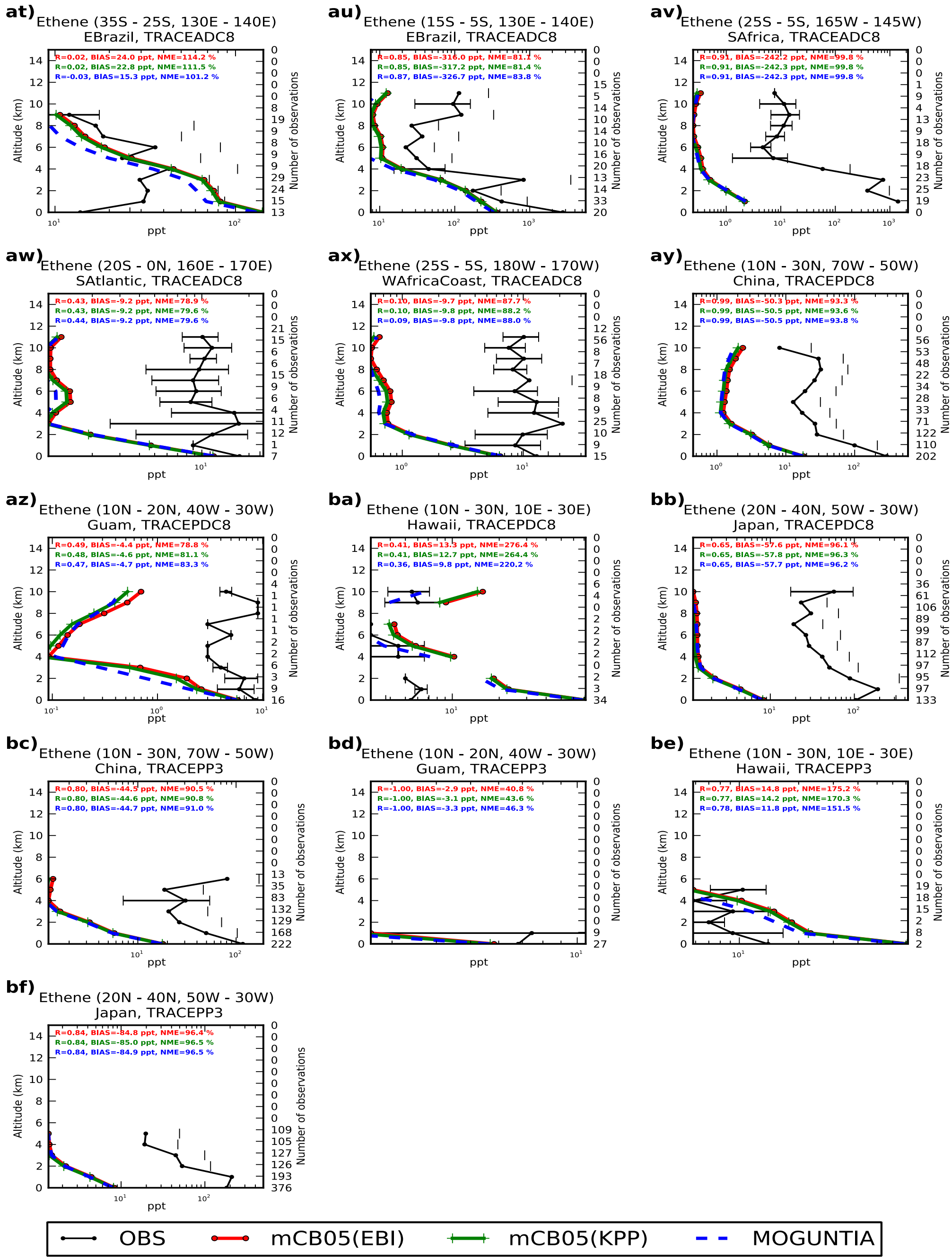
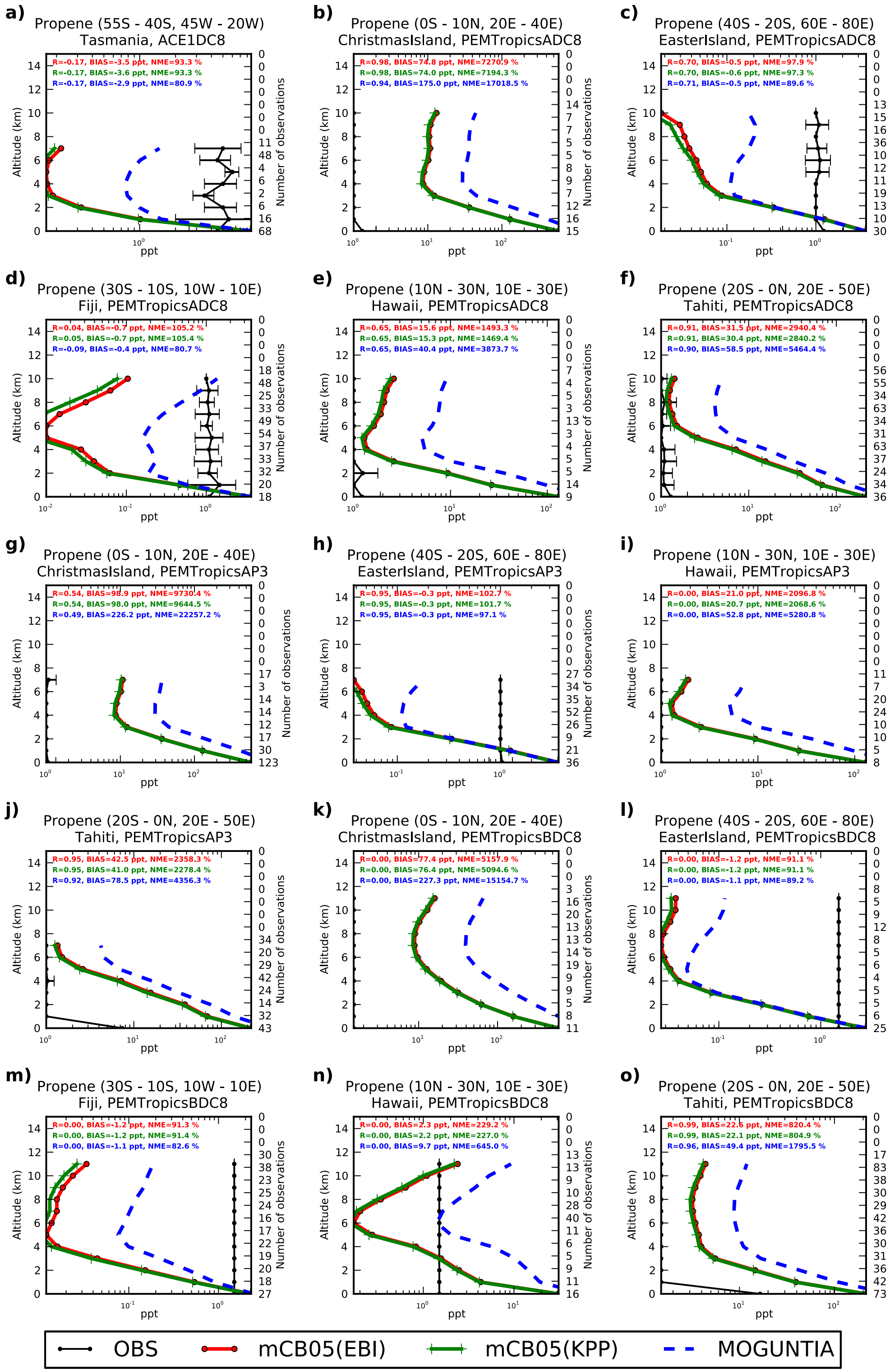
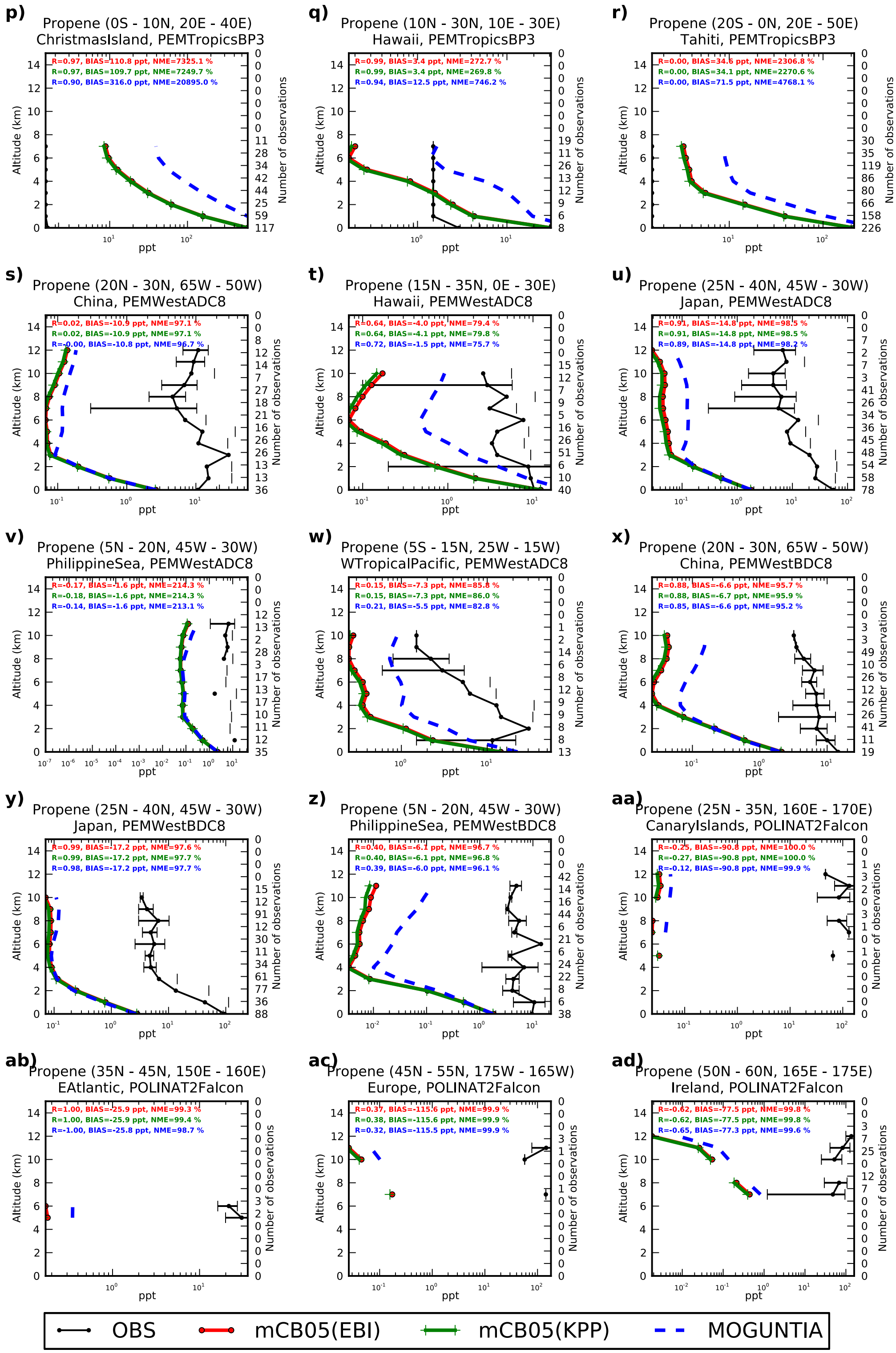
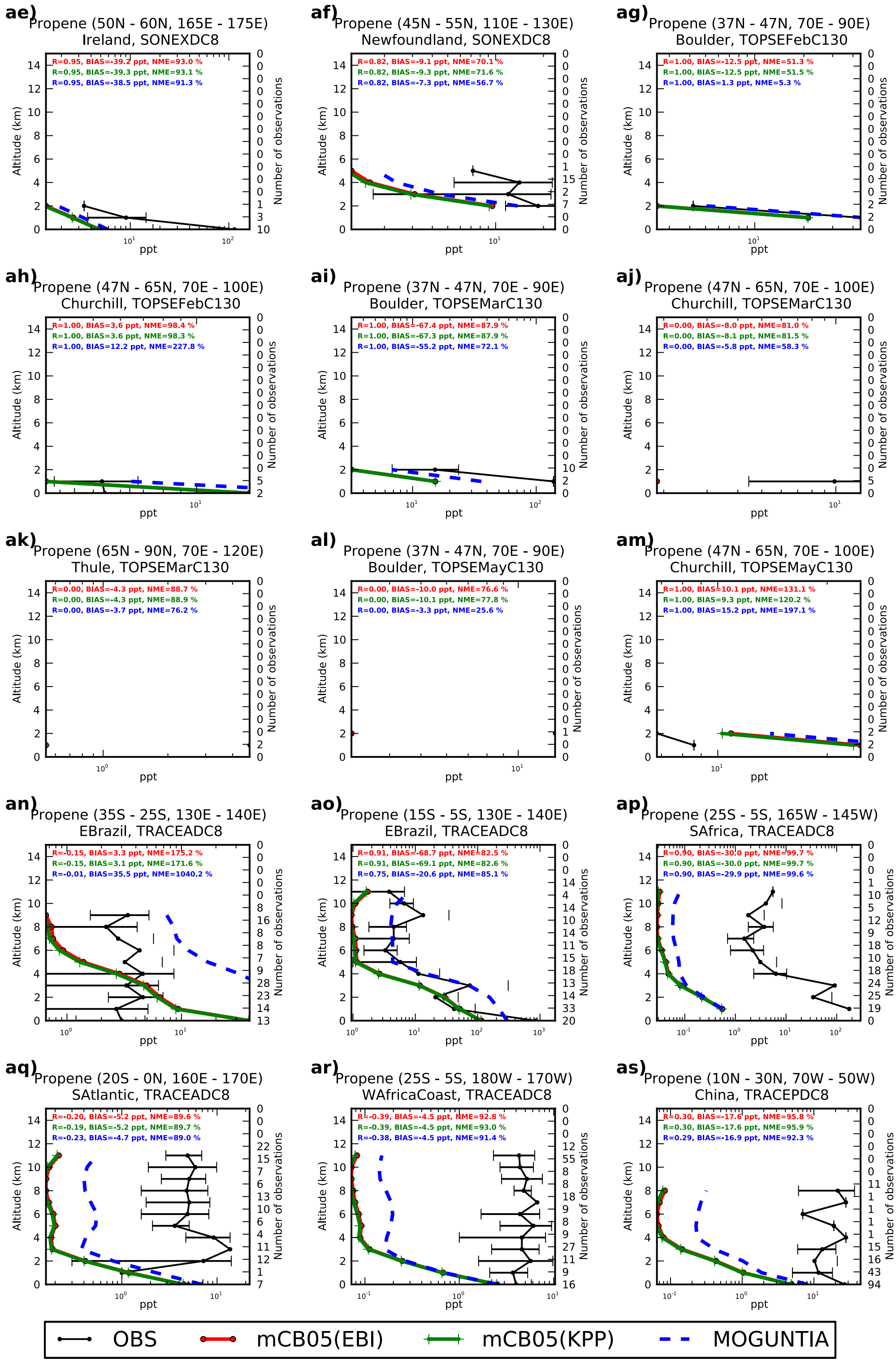


Figure S 9: Comparison of TM5-MP vertical profiles (in km) of C_2H_4 against aircraft observations (black line) in ppt, with model results (red-line for mCB05(EBI), green-line for mCB05(KPP) and blue-line for MOGUNTIA), using co-located model output for 2006 sampled at the measurement times; error bars indicate the standard deviation. The numbers on the right vertical axis indicate the number of available measurements.



a) Propene (55S - 40S, 45W - 20W) Tasmania, ACE1DC8
R=-0.17, BIAS=-3.5 ppt, NME=93.3 %
R=-0.17, BIAS=-3.6 ppt, NME=93.3 %
R=-0.17, BIAS=-2.9 ppt, NME=80.9 %
b) Propene (0S - 10N, 20E - 40E) ChristmasIsland, PEMTropicsADC8
R=0.98, BIAS=74.8 ppt, NME=7270.9 %
R=0.98, BIAS=74.0 ppt, NME=7194.3 %
R=0.94, BIAS=175.0 ppt, NME=17018.5 %
c) Propene (40S - 20S, 60E - 80E) EasterIsland, PEMTropicsADC8
R=0.70, BIAS=-0.5 ppt, NME=97.9 %
R=0.70, BIAS=-0.6 ppt, NME=97.3 %
R=0.71, BIAS=-0.5 ppt, NME=89.6 %
d) Propene (30S - 10S, 10W - 10E) Fiji, PEMTropicsADC8
R=0.04, BIAS=-0.7 ppt, NME=105.2 %
R=0.05, BIAS=-0.7 ppt, NME=105.4 %
R=-0.09, BIAS=-0.4 ppt, NME=80.7 %
e) Propene (10N - 30N, 10E - 30E) Hawaii, PEMTropicsADC8
R=0.65, BIAS=15.6 ppt, NME=1493.3 %
R=0.65, BIAS=15.3 ppt, NME=1469.4 %
R=0.65, BIAS=40.4 ppt, NME=3873.7 %
f) Propene (20S - 0N, 20E - 50E) Tahiti, PEMTropicsADC8
R=0.91, BIAS=31.5 ppt, NME=2940.4 %
R=0.91, BIAS=30.4 ppt, NME=2840.2 %
R=0.90, BIAS=58.5 ppt, NME=5464.4 %
g) Propene (0S - 10N, 20E - 40E) ChristmasIsland, PEMTropicsAP3
R=0.54, BIAS=98.9 ppt, NME=9730.4 %
R=0.54, BIAS=98.0 ppt, NME=9644.5 %
R=0.49, BIAS=226.2 ppt, NME=22257.2 %
h) Propene (40S - 20S, 60E - 80E) EasterIsland, PEMTropicsAP3
R=0.95, BIAS=-0.3 ppt, NME=102.7 %
R=0.95, BIAS=-0.3 ppt, NME=101.7 %
R=0.95, BIAS=-0.3 ppt, NME=97.1 %
i) Propene (10N - 30N, 10E - 30E) Hawaii, PEMTropicsAP3
R=0.00, BIAS=21.0 ppt, NME=2096.8 %
R=0.00, BIAS=20.7 ppt, NME=2068.6 %
R=0.00, BIAS=52.8 ppt, NME=5280.8 %
j) Propene (20S - 0N, 20E - 50E) Tahiti, PEMTropicsAP3
R=0.95, BIAS=42.5 ppt, NME=2358.3 %
R=0.95, BIAS=41.0 ppt, NME=2278.4 %
R=0.92, BIAS=78.5 ppt, NME=4356.3 %
k) Propene (0S - 10N, 20E - 40E) ChristmasIsland, PEMTropicsBDC8
R=0.00, BIAS=77.4 ppt, NME=5157.9 %
R=0.00, BIAS=76.4 ppt, NME=5094.6 %
R=0.00, BIAS=227.3 ppt, NME=15154.7 %
l) Propene (40S - 20S, 60E - 80E) EasterIsland, PEMTropicsBDC8
R=0.00, BIAS=-1.2 ppt, NME=91.1 %
R=0.00, BIAS=-1.2 ppt, NME=91.1 %
R=0.00, BIAS=-1.1 ppt, NME=89.2 %
m) Propene (30S - 10S, 10W - 10E) Fiji, PEMTropicsBDC8
R=0.00, BIAS=-1.2 ppt, NME=91.3 %
R=0.00, BIAS=-1.2 ppt, NME=91.4 %
R=0.00, BIAS=-1.1 ppt, NME=82.6 %
n) Propene (10N - 30N, 10E - 30E) Hawaii, PEMTropicsBDC8
R=0.00, BIAS=2.3 ppt, NME=229.2 %
R=0.00, BIAS=2.2 ppt, NME=227.0 %
R=0.00, BIAS=9.7 ppt, NME=645.0 %
o) Propene (20S - 0N, 20E - 50E) Tahiti, PEMTropicsBDC8
R=0.99, BIAS=22.6 ppt, NME=820.4 %
R=0.99, BIAS=22.1 ppt, NME=804.9 %
R=0.96, BIAS=49.4 ppt, NME=1795.5 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


p)
Propene (0S - 10N, 20E - 40E)
ChristmasIsland, PEMTropicsBP3
R=0.97, BIAS=110.8 ppt, NME=7325.1 %
R=0.97, BIAS=109.7 ppt, NME=7249.7 %
R=0.90, BIAS=316.0 ppt, NME=20895.0 %
q)
Propene (10N - 30N, 10E - 30E)
Hawaii, PEMTropicsBP3
R=0.99, BIAS=3.4 ppt, NME=272.7 %
R=0.99, BIAS=3.4 ppt, NME=269.8 %
R=0.94, BIAS=12.5 ppt, NME=746.2 %
r)
Propene (20S - 0N, 20E - 50E)
Tahiti, PEMTropicsBP3
R=0.00, BIAS=34.6 ppt, NME=2306.8 %
R=0.00, BIAS=34.1 ppt, NME=2270.6 %
R=0.00, BIAS=71.5 ppt, NME=4768.1 %
s)
Propene (20N - 30N, 65W - 50W)
China, PEMWestADC8
R=0.02, BIAS=-10.9 ppt, NME=97.1 %
R=0.02, BIAS=-10.9 ppt, NME=97.1 %
R=-0.00, BIAS=-10.8 ppt, NME=96.7 %
t)
Propene (15N - 35N, 0E - 30E)
Hawaii, PEMWestADC8
R=0.64, BIAS=-4.0 ppt, NME=79.4 %
R=0.64, BIAS=-4.1 ppt, NME=79.8 %
R=0.72, BIAS=-1.5 ppt, NME=75.7 %
u)
Propene (25N - 40N, 45W - 30W)
Japan, PEMWestADC8
R=0.91, BIAS=-14.8 ppt, NME=98.5 %
R=0.91, BIAS=-14.8 ppt, NME=98.5 %
R=0.89, BIAS=-14.8 ppt, NME=98.2 %
v)
Propene (5N - 20N, 45W - 30W)
PhilippineSea, PEMWestADC8
R=-0.17, BIAS=-1.6 ppt, NME=214.3 %
R=-0.18, BIAS=-1.6 ppt, NME=214.3 %
R=-0.14, BIAS=-1.6 ppt, NME=213.1 %
w)
Propene (5S - 15N, 25W - 15W)
WTropicalPacific, PEMWestADC8
R=0.15, BIAS=-7.3 ppt, NME=85.8 %
R=0.15, BIAS=-7.3 ppt, NME=86.0 %
R=0.21, BIAS=-5.5 ppt, NME=82.8 %
x)
Propene (20N - 30N, 65W - 50W)
China, PEMWestBDC8
R=0.88, BIAS=-6.6 ppt, NME=95.7 %
R=0.88, BIAS=-6.7 ppt, NME=95.9 %
R=0.85, BIAS=-6.6 ppt, NME=95.2 %
y)
Propene (25N - 40N, 45W - 30W)
Japan, PEMWestBDC8
R=0.99, BIAS=-17.2 ppt, NME=97.6 %
R=0.99, BIAS=-17.2 ppt, NME=97.7 %
R=0.98, BIAS=-17.2 ppt, NME=97.7 %
z)
Propene (5N - 20N, 45W - 30W)
PhilippineSea, PEMWestBDC8
R=0.40, BIAS=-6.1 ppt, NME=96.7 %
R=0.40, BIAS=-6.1 ppt, NME=96.8 %
R=0.39, BIAS=-6.0 ppt, NME=96.1 %
aa)
Propene (25N - 35N, 160E - 170E)
CanaryIslands, POLINAT2Falcon
R=-0.25, BIAS=-90.8 ppt, NME=100.0 %
R=-0.27, BIAS=-90.8 ppt, NME=100.0 %
R=-0.12, BIAS=-90.8 ppt, NME=99.9 %
ab)
Propene (35N - 45N, 150E - 160E)
EAtlantic, POLINAT2Falcon
R=1.00, BIAS=-25.9 ppt, NME=99.3 %
R=1.00, BIAS=-25.9 ppt, NME=99.4 %
R=-1.00, BIAS=-25.8 ppt, NME=98.7 %
ac)
Propene (45N - 55N, 175W - 165W)
Europe, POLINAT2Falcon
R=0.37, BIAS=-115.6 ppt, NME=99.9 %
R=0.38, BIAS=-115.6 ppt, NME=99.9 %
R=0.32, BIAS=-115.5 ppt, NME=99.9 %
ad)
Propene (50N - 60N, 165E - 175E)
Ireland, POLINAT2Falcon
R=-0.62, BIAS=-77.5 ppt, NME=99.8 %
R=-0.62, BIAS=-77.5 ppt, NME=99.8 %
R=-0.65, BIAS=-77.3 ppt, NME=99.6 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA


ae) Propene (50N - 60N, 165E - 175E)
Ireland, SONEXDC8
R=0.95, BIAS=-39.2 ppt, NME=93.0 %
R=0.95, BIAS=-39.3 ppt, NME=93.1 %
R=0.95, BIAS=-38.5 ppt, NME=91.3 %
af) Propene (45N - 55N, 110E - 130E)
Newfoundland, SONEXDC8
R=0.82, BIAS=-9.1 ppt, NME=70.1 %
R=0.82, BIAS=-9.3 ppt, NME=71.6 %
R=0.82, BIAS=-7.3 ppt, NME=56.7 %
ag) Propene (37N - 47N, 70E - 90E)
Boulder, TOPSEFebC130
R=1.00, BIAS=-12.5 ppt, NME=51.3 %
R=1.00, BIAS=-12.5 ppt, NME=51.5 %
R=1.00, BIAS=1.3 ppt, NME=5.3 %
ah) Propene (47N - 65N, 70E - 100E)
Churchill, TOPSEFebC130
R=1.00, BIAS=3.6 ppt, NME=98.4 %
R=1.00, BIAS=3.6 ppt, NME=98.3 %
R=1.00, BIAS=12.2 ppt, NME=227.8 %
ai) Propene (37N - 47N, 70E - 90E)
Boulder, TOPSEMarC130
R=1.00, BIAS=-67.4 ppt, NME=87.9 %
R=1.00, BIAS=-67.3 ppt, NME=87.9 %
R=1.00, BIAS=-55.2 ppt, NME=72.1 %
aj) Propene (47N - 65N, 70E - 100E)
Churchill, TOPSEMarC130
R=0.00, BIAS=-8.0 ppt, NME=81.0 %
R=0.00, BIAS=-8.1 ppt, NME=81.5 %
R=0.00, BIAS=-5.8 ppt, NME=58.3 %
ak) Propene (65N - 90N, 70E - 120E)
Thule, TOPSEMarC130
R=0.00, BIAS=-4.3 ppt, NME=88.7 %
R=0.00, BIAS=-4.3 ppt, NME=88.9 %
R=0.00, BIAS=-3.7 ppt, NME=76.2 %
al) Propene (37N - 47N, 70E - 90E)
Boulder, TOPSEMayC130
R=0.00, BIAS=-10.0 ppt, NME=76.6 %
R=0.00, BIAS=-10.1 ppt, NME=77.8 %
R=0.00, BIAS=-3.3 ppt, NME=25.6 %
am) Propene (47N - 65N, 70E - 100E)
Churchill, TOPSEMayC130
R=1.00, BIAS=10.1 ppt, NME=131.1 %
R=1.00, BIAS=9.3 ppt, NME=120.2 %
R=1.00, BIAS=15.2 ppt, NME=197.1 %
an) Propene (35S - 25S, 130E - 140E)
EBrazil, TRACEADC8
R=-0.15, BIAS=3.3 ppt, NME=175.2 %
R=-0.15, BIAS=3.1 ppt, NME=171.6 %
R=-0.01, BIAS=35.5 ppt, NME=1040.2 %
ao) Propene (15S - 5S, 130E - 140E)
EBrazil, TRACEADC8
R=0.91, BIAS=-68.7 ppt, NME=82.5 %
R=0.91, BIAS=-69.1 ppt, NME=82.6 %
R=0.75, BIAS=-20.6 ppt, NME=85.1 %
ap) Propene (25S - 5S, 165W - 145W)
SAfrica, TRACEADC8
R=0.90, BIAS=-30.0 ppt, NME=99.7 %
R=0.90, BIAS=-30.0 ppt, NME=99.7 %
R=0.90, BIAS=-29.9 ppt, NME=99.6 %
aq) Propene (20S - 0N, 160E - 170E)
SAtlantic, TRACEADC8
R=-0.20, BIAS=-5.2 ppt, NME=89.6 %
R=-0.19, BIAS=-5.2 ppt, NME=89.7 %
R=-0.23, BIAS=-4.7 ppt, NME=89.0 %
ar) Propene (25S - 5S, 180W - 170W)
WAfricaCoast, TRACEADC8
R=-0.39, BIAS=-4.5 ppt, NME=92.8 %
R=-0.39, BIAS=-4.5 ppt, NME=93.0 %
R=-0.38, BIAS=-4.5 ppt, NME=91.4 %
as) Propene (10N - 30N, 70W - 50W)
China, TRACEPDC8
R=0.30, BIAS=-17.6 ppt, NME=95.8 %
R=0.30, BIAS=-17.6 ppt, NME=95.9 %
R=0.29, BIAS=-16.9 ppt, NME=92.3 %
Altitude (km)
ppt
Number of observations
OBS
mCB05(EBI)
mCB05(KPP)
MOGUNTIA

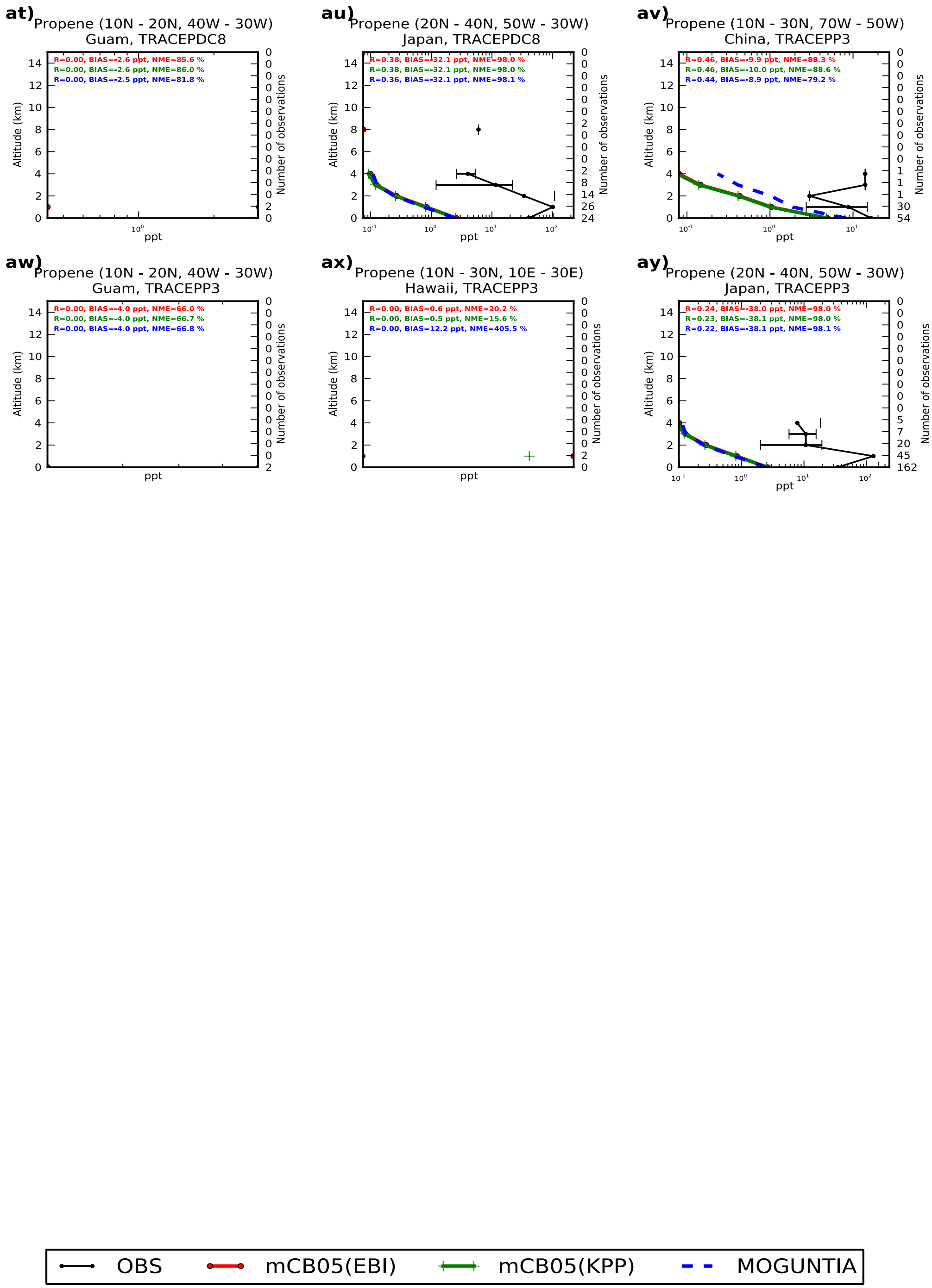


Figure S 10: Comparison of TM5-MP vertical profiles (in km) of C_3H_6 against aircraft observations (black line) in ppt, with model results (red-line for mCB05(EBI), green-line for mCB05(KPP) and blue-line for MOGUNTIA), using co-located model output for 2006 sampled at the measurement times; error bars indicate the standard deviation. The numbers on the right vertical axis indicate the number of available measurements.

Supplementary References

Browne, E. C., Wooldridge, P. J., Min, K.-E. and Cohen, R. C.: On the role of monoterpene chemistry in the remote continental boundary layer, Atmos. Chem. Phys., 14(3), 1225–1238, doi:10.5194/acp-14-1225-2014, 2014.

Ito, A., Sillman, S. and Penner, J. E.: Effects of additional nonmethane volatile organic compounds, organic nitrates, and direct emissions of oxygenated organic species on global tropospheric chemistry, J. Geophys. Res., 112(D6), D06309, doi:10.1029/2005JD006556, 2007.

Sander, R.: Compilation of Henry's law constants (version 4.0) for water as solvent, Atmos. Chem. Phys., 15(8), 4399–4981, doi:10.5194/acp-15-4399-2015, 2015.