Supplement of Atmos. Chem. Phys., 19, 11953–11968, 2019
https://doi.org/10.5194/acp-19-11953-2019-supplement


Atmospheric Chemistry and Physics
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*Supplement of*

# Diurnal variability, photochemical production and loss processes of hydrogen peroxide in the boundary layer over Europe

**Horst Fischer et al.**

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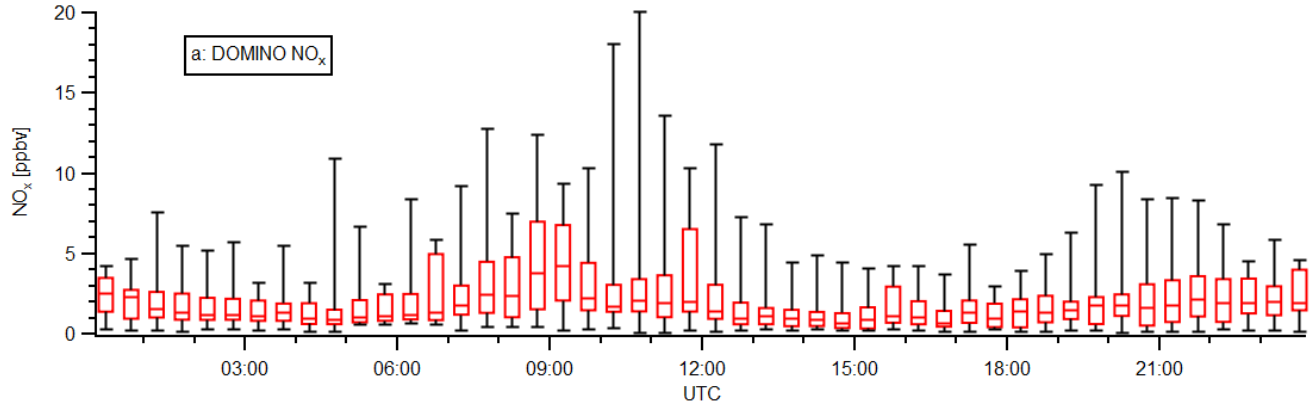
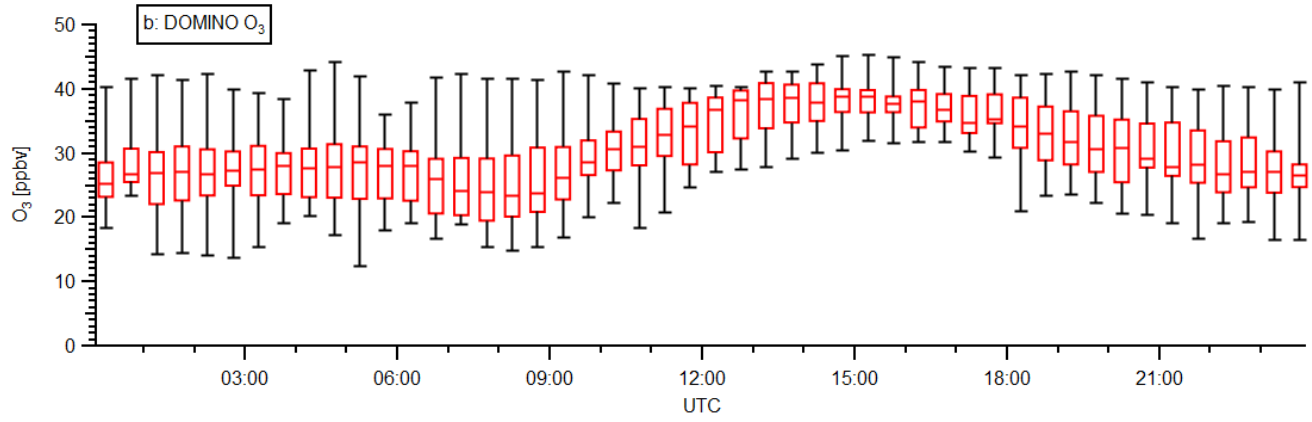
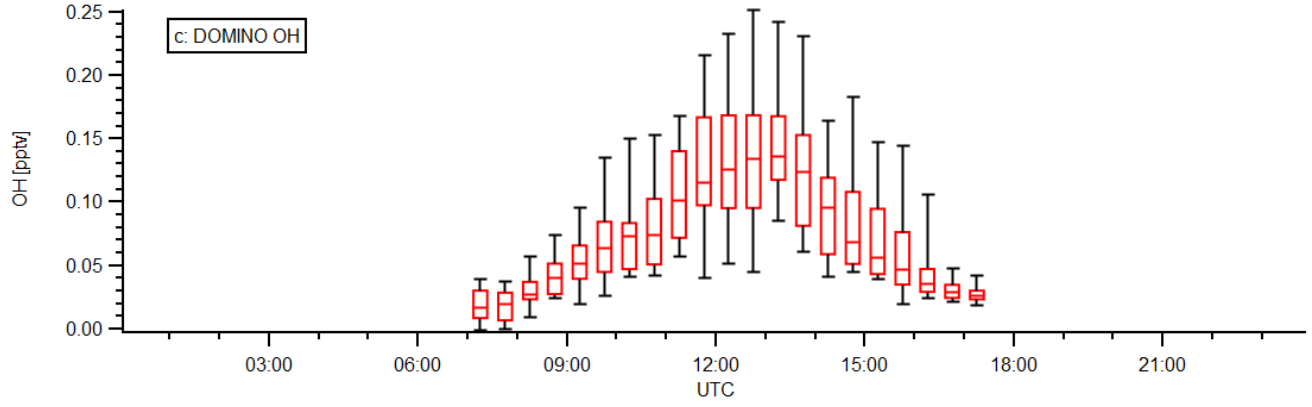
Table S1: Data coverage in %.

| | **DOMINO** | **HUMPPA** | **PARADE** | **HOPE** | **CYPHEX** |
|---|---|---|---|---|---|
| **$H_2O_2$** | 90.06 | 93.66 | 86.13 | 25.79 | 82.47 |
| **NOx** | 90.06 | 95.1 | 92.3 | 100 | 90.71 |
| **$O_3$** | 90.06 | 95.1 | 84.6 | 100 | 90.71 |
| **OH** | 80.88 | 70.02 | 38.33 | 98.89 | 70.48 |
| **$HO_2$** | 81.44 | 14.7 | 22.77 | 29.84 | 41.16 |
| **$JNO_2$** | 95.36 | 95.17 | 100 | 100 | 73.25 |


a: DOMINO $NO_x$
$NO_x$ [ppbv]
0
5
10
15
20
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC


b: DOMINO $O_3$
$O_3$ [ppbv]
0
10
20
30
40
50
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC

5


c: DOMINO OH
OH [pptv]
0.00
0.05
0.10
0.15
0.20
0.25
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC

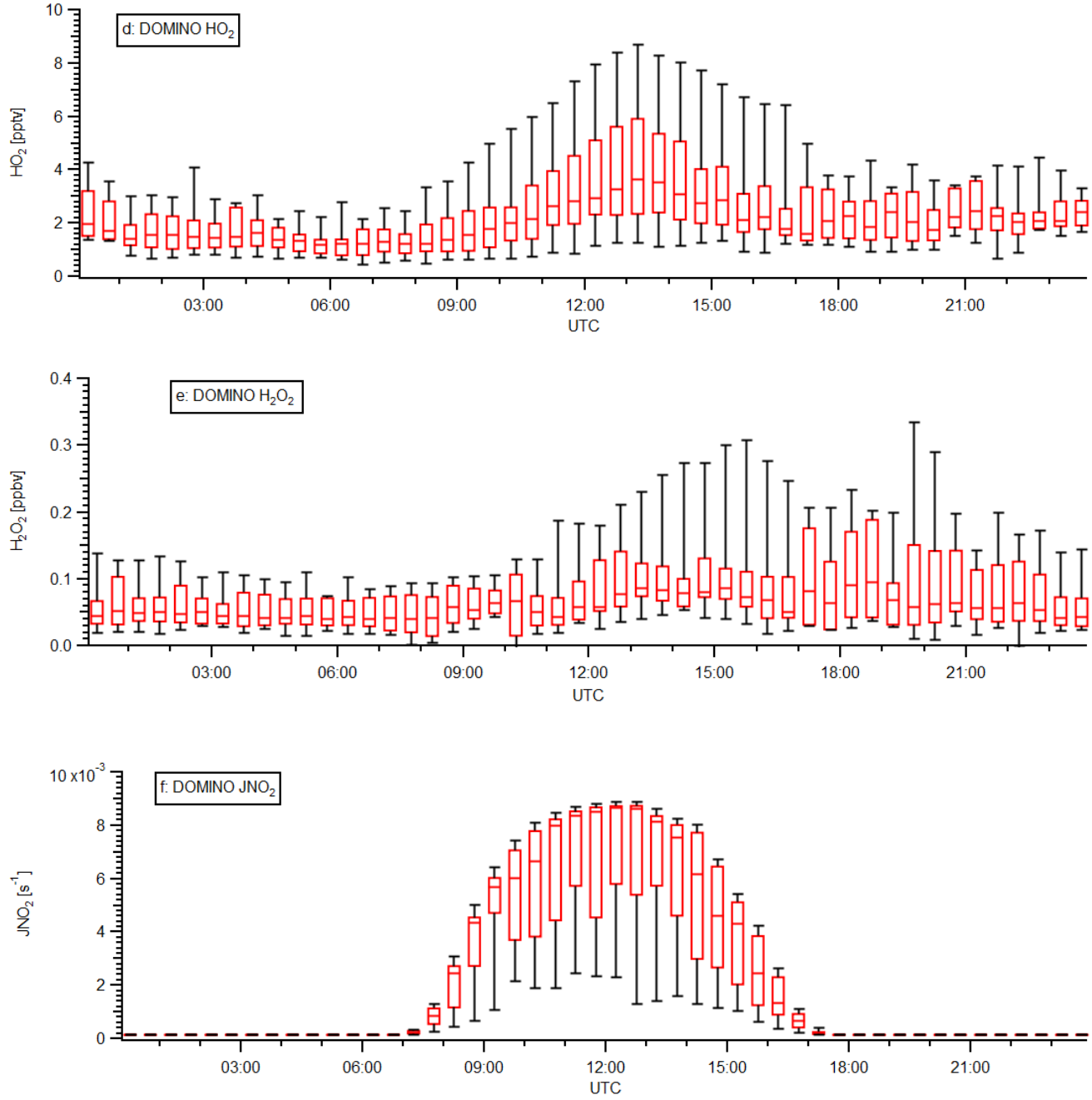
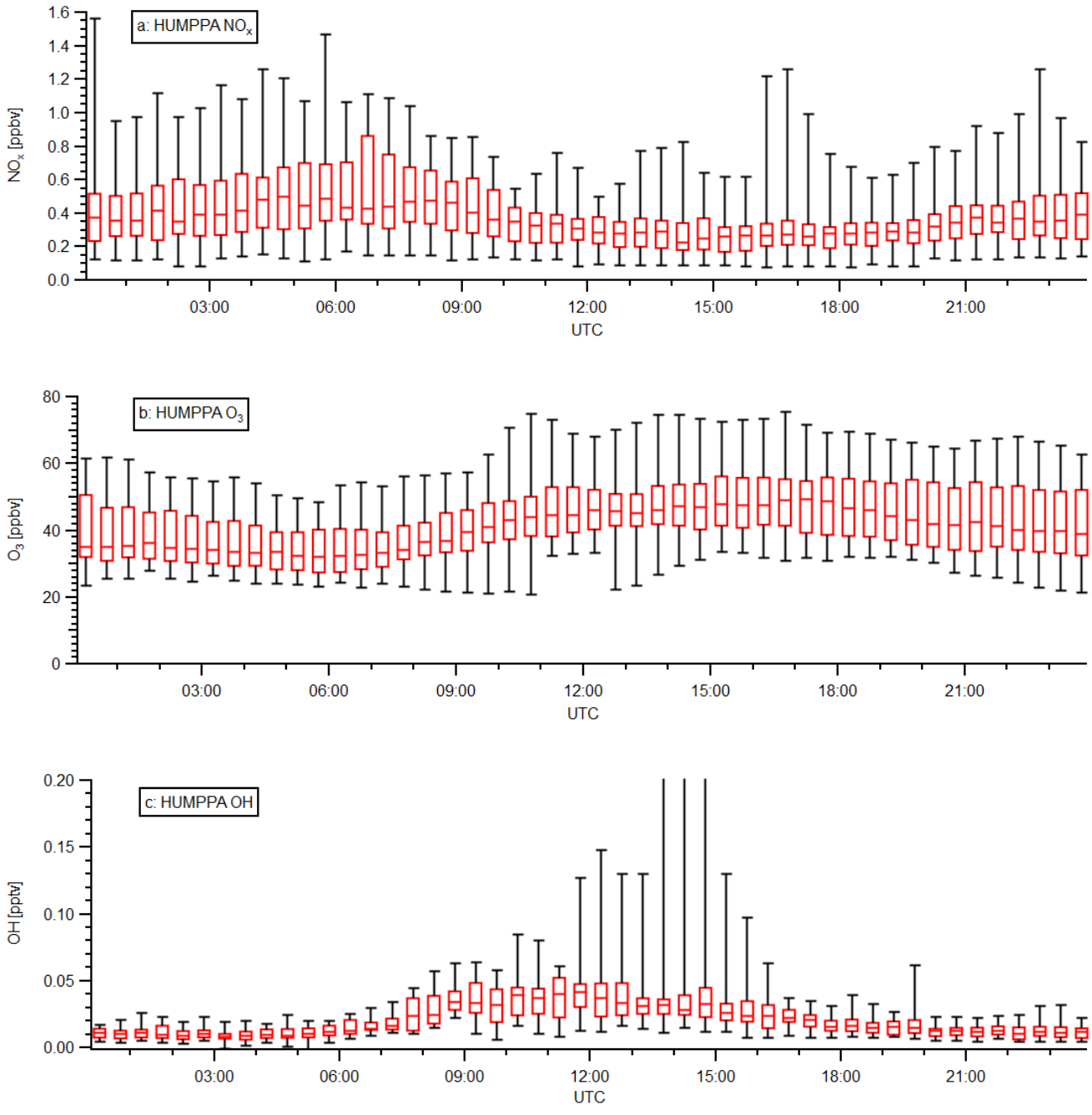



Figure S1: Diurnal variations (median, box: 25 and 75% quartiles, whiskers: min and max) for 30 min bins obtained for the DOMINO campaign: a: NOx, b: $O_3$, c: OH, d: $HO_2$, e: $H_2O_2$ and f: $JNO_2$. Note that local noon is 11:30 UTC.


a: HUMPPA $NO_x$
$NO_x$ [pptv]
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC
b: HUMPPA $O_3$
$O_3$ [ppbv]
80
60
40
20
0
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC
c: HUMPPA OH
OH [pptv]
0.20
0.15
0.10
0.05
0.00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC

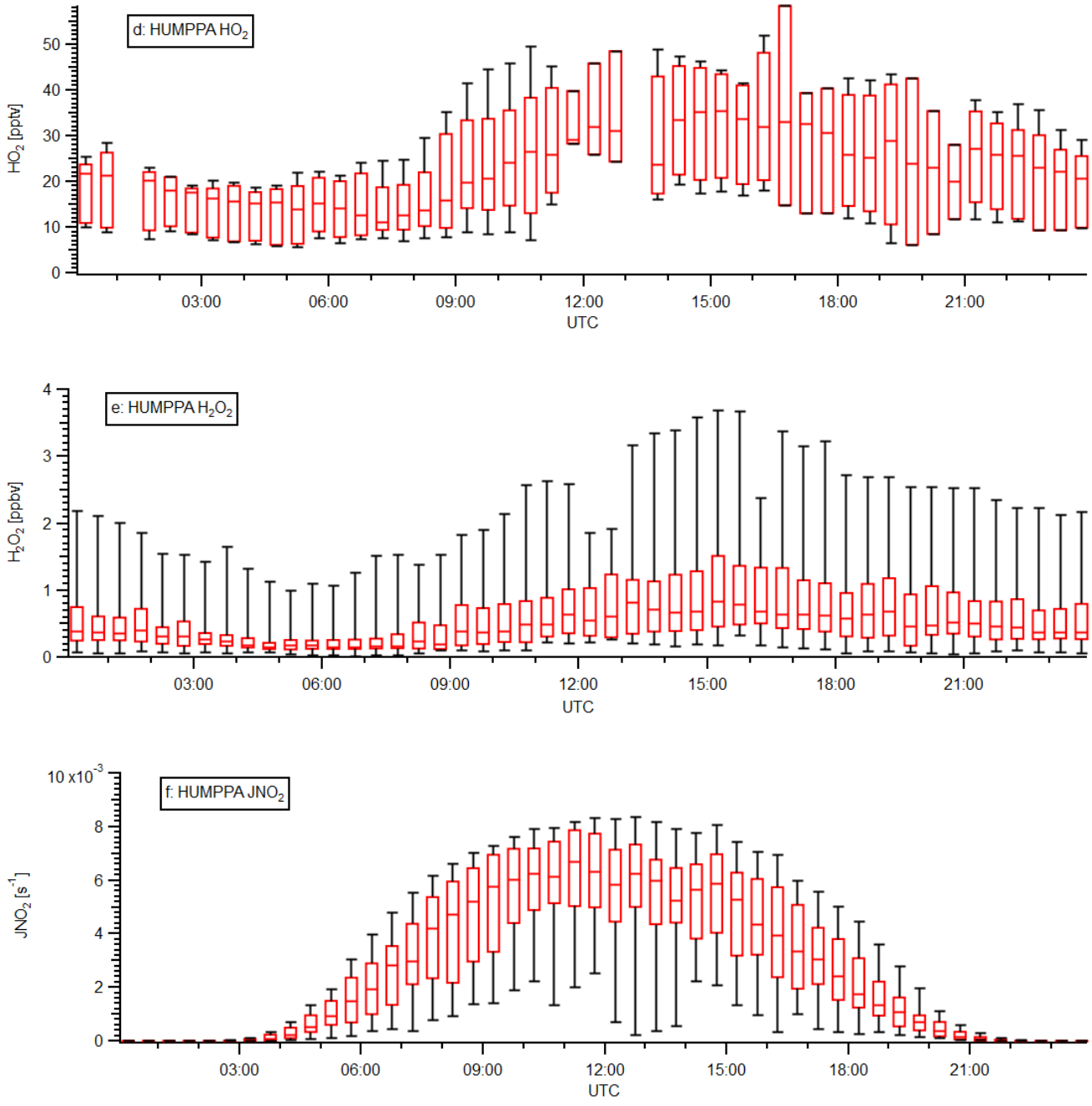
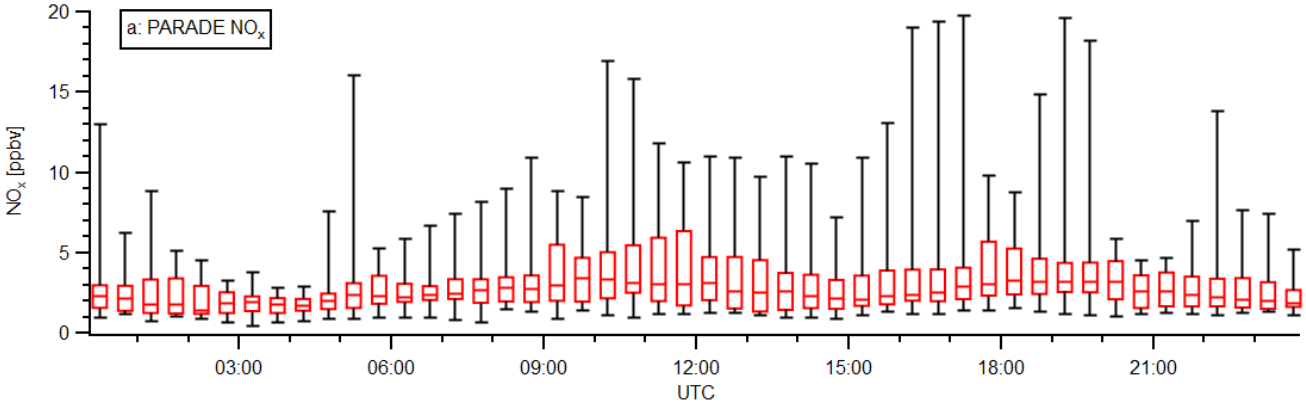
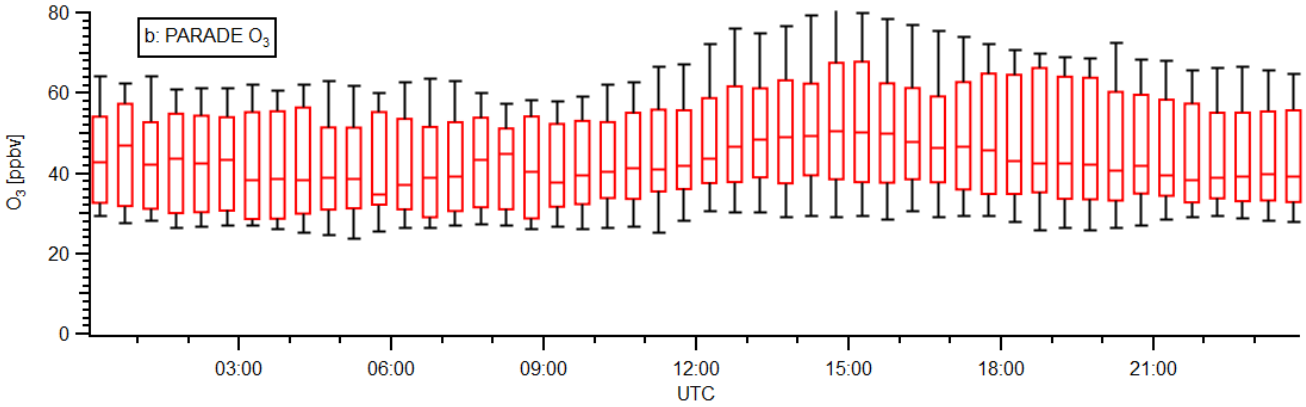
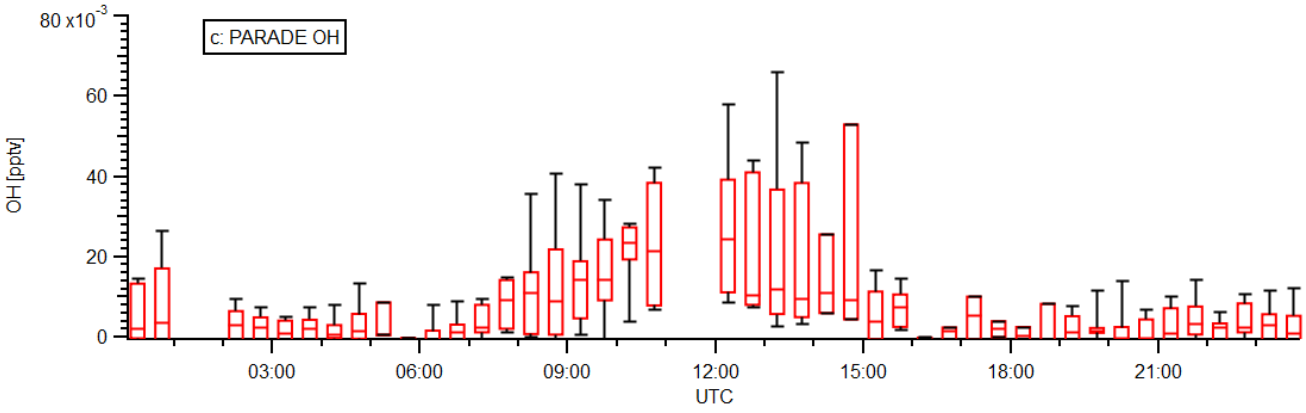



Figure S2: Diurnal variations (median, box: 25 and 75% quartiles, whiskers: min and max) for 30 min bins obtained for the HUMPPA campaign: a: NOx, b: $O_3$, c: OH, d: $HO_2$, e: $H_2O_2$ and f: $JNO_2$. Local noon is 13:30 UTC.


a: PARADE NOx
NOx [ppbv]
0
5
10
15
20
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC


b: PARADE O3
O3 [ppbv]
0
20
40
60
80
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC


c: PARADE OH
80 x10-3
OH [pptv]
0
20
40
60
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC

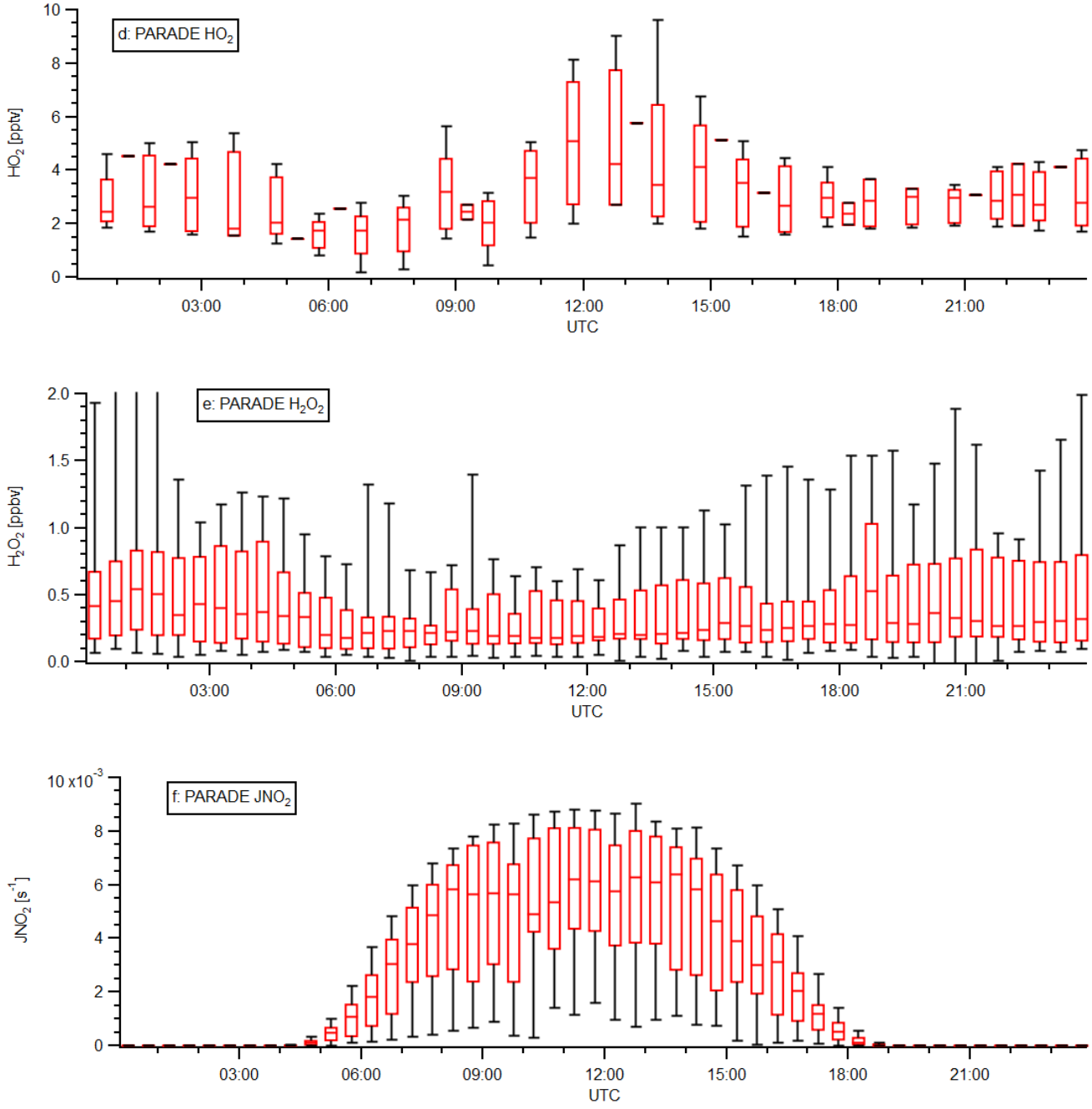
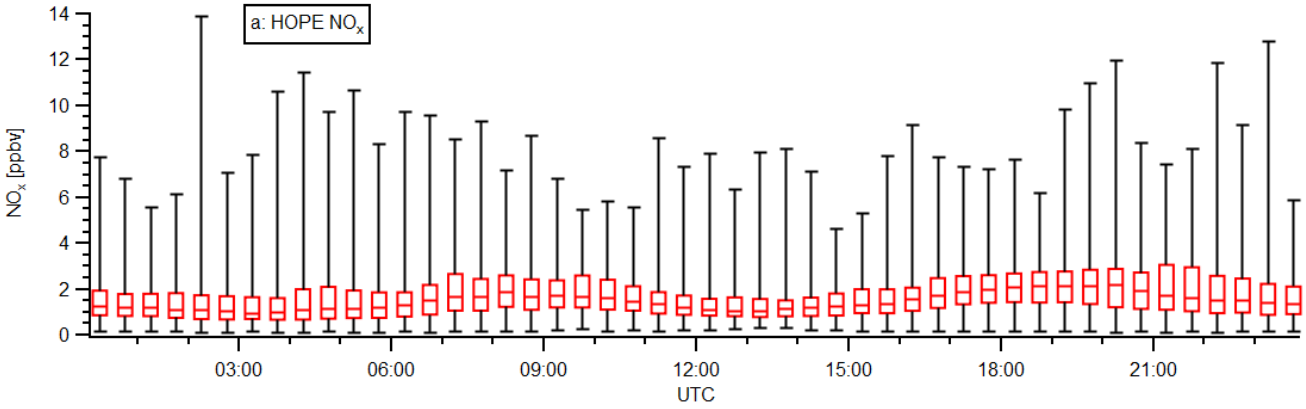
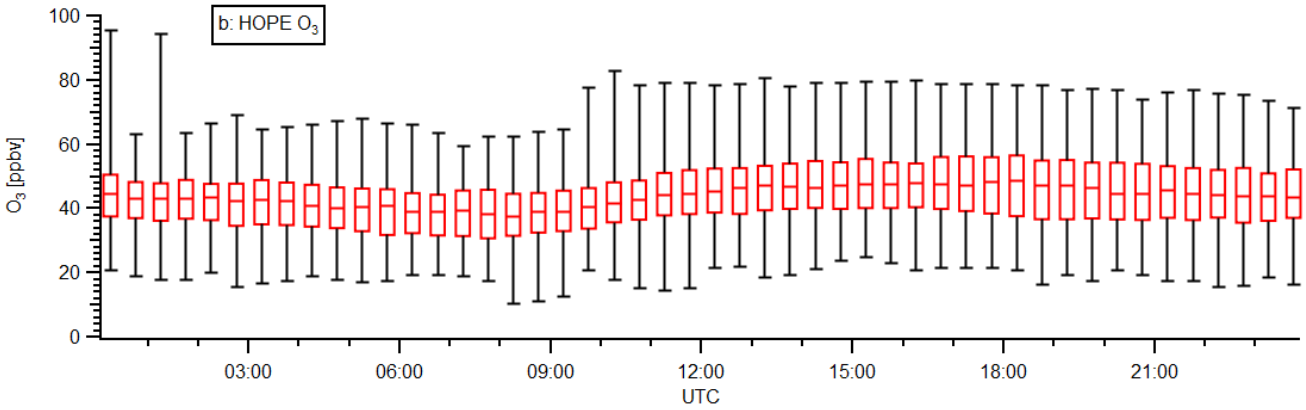
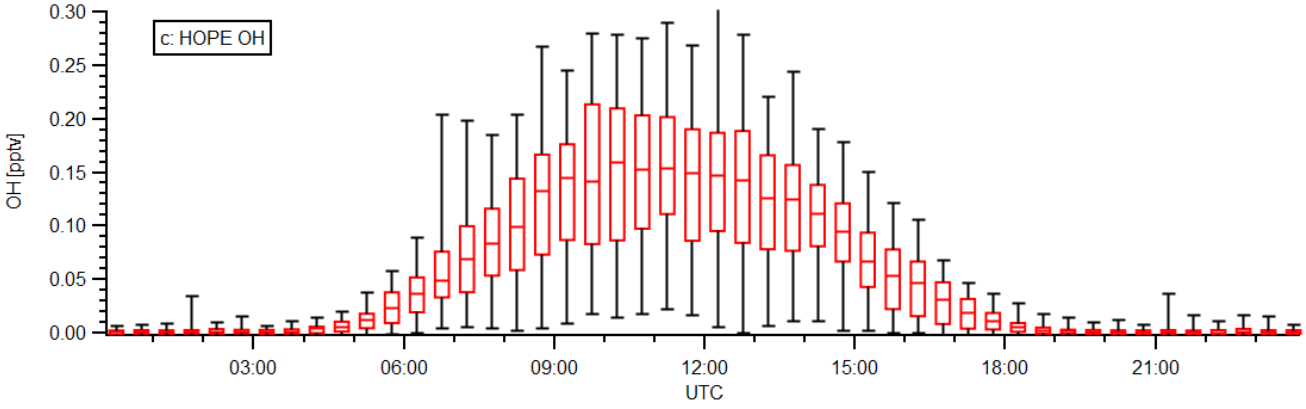



Figure S3: Diurnal variations (median, box: 25 and 75% quartiles, whiskers: min and max) for 30 min bins obtained for the PARADE campaign: a: NOx, b: $O_3$, c: OH, d: $HO_2$, e: $H_2O_2$ and f: $JNO_2$. Local noon is 12:30 UTC.


a: HOPE $NO_x$
$NO_x$ [ppbv]
0
2
4
6
8
10
12
14
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC


b: HOPE $O_3$
$O_3$ [ppbv]
0
20
40
60
80
100
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC


c: HOPE OH
OH [pptv]
0.00
0.05
0.10
0.15
0.20
0.25
0.30
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC

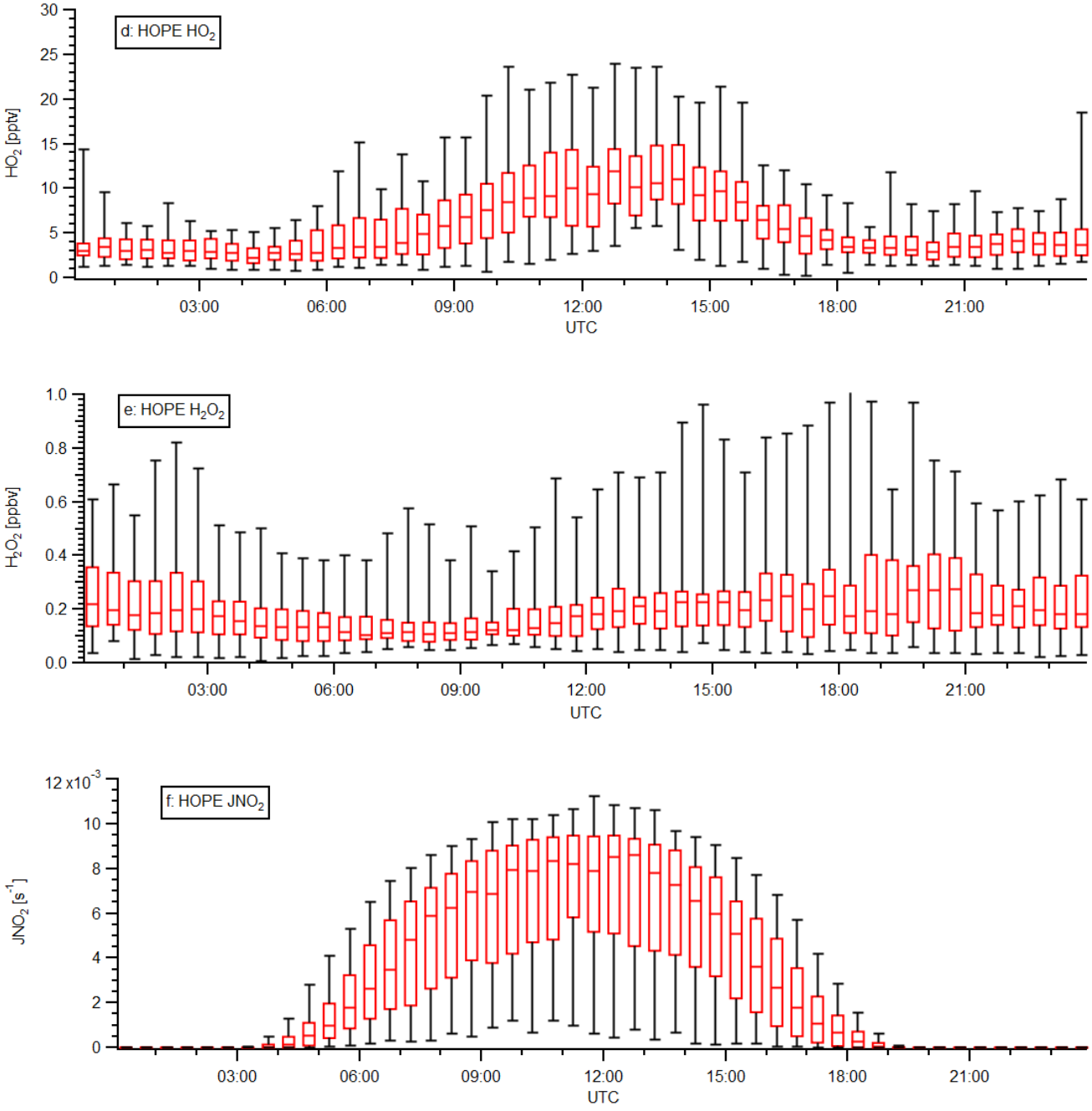
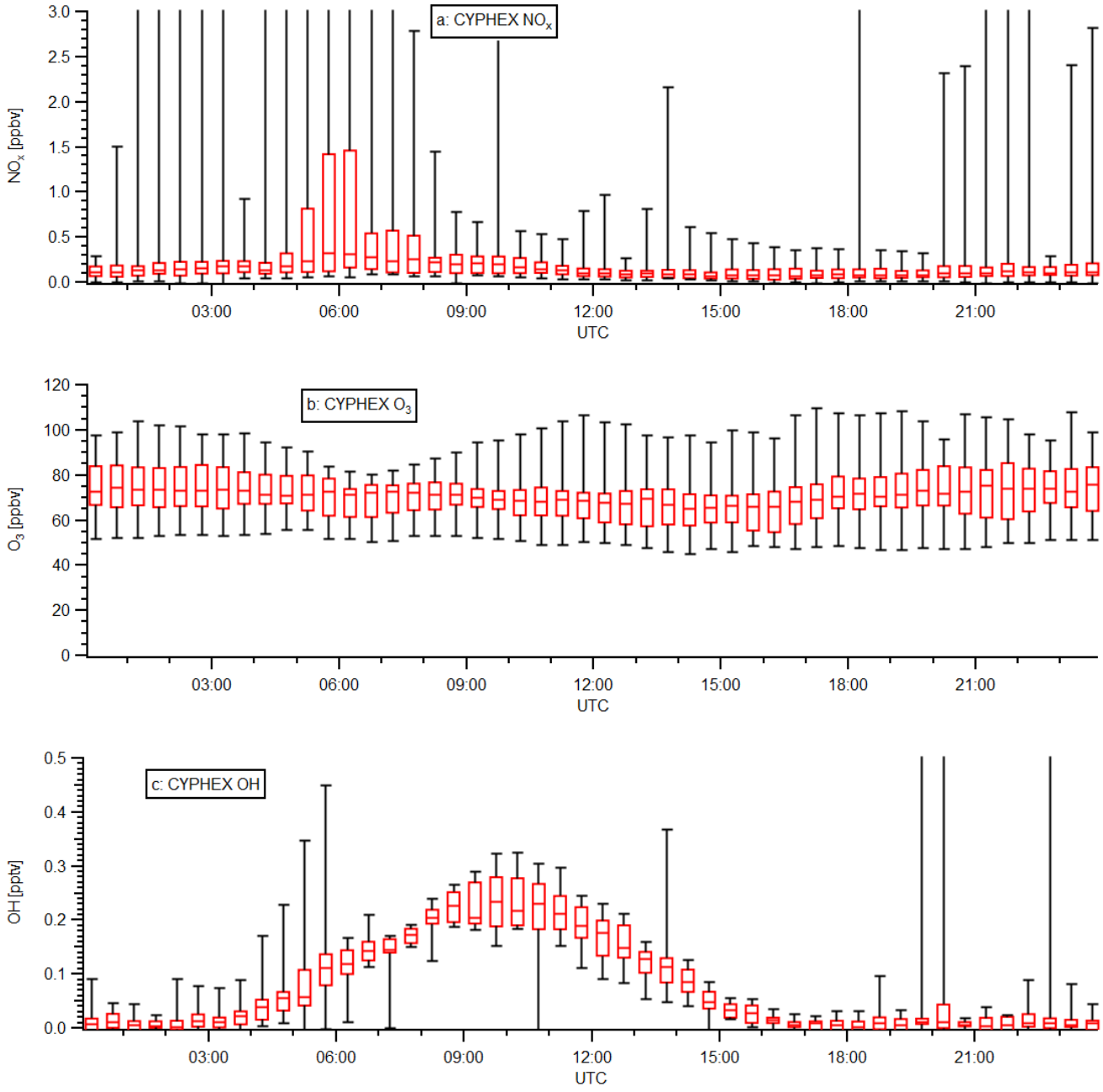



Figure S4: Diurnal variations (median, box: 25 and 75% quartiles, whiskers: min and max) for 30 min bins obtained for the HOPE campaign: a: NOx, b: $O_3$, c: OH, d: $HO_2$, e: $H_2O_2$ and f: $JNO_2$. Local noon is 12:45 UTC.


a: CYPHEX NOx
NOx [ppbv]
3.0
2.5
2.0
1.5
1.0
0.5
0.0
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC
b: CYPHEX O3
O3 [ppbv]
120
100
80
60
40
20
0
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC
c: CYPHEX OH
OH [pptv]
0.5
0.4
0.3
0.2
0.1
0.0
03:00
06:00
09:00
12:00
15:00
18:00
21:00
UTC

5

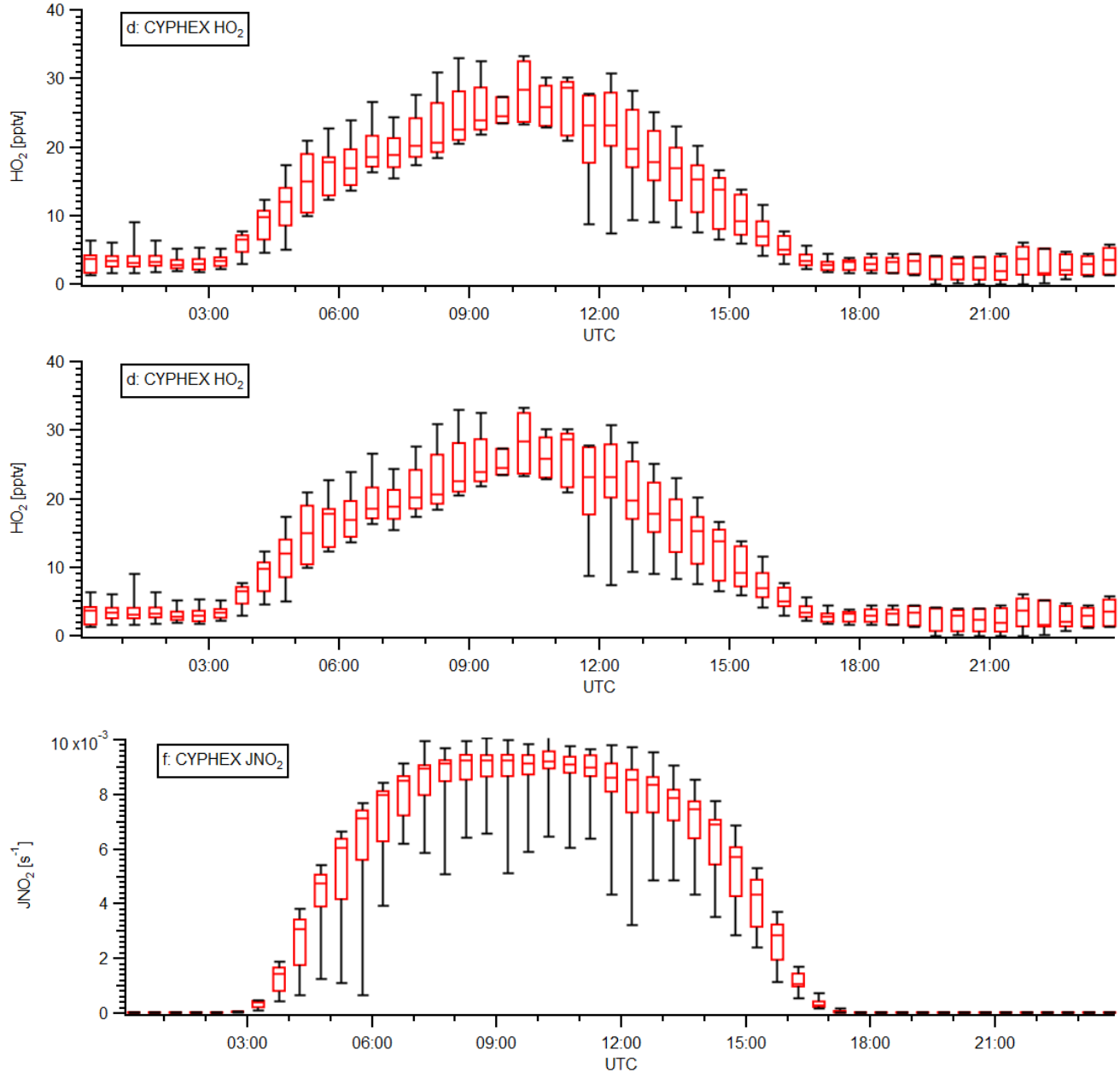



Figure S5: Diurnal variations (median, box: 25 and 75% quartiles, whiskers: min and max) for 30 min bins obtained for the CYPHEX campaign: a: NOx, b: $O_3$, c: OH, d: $HO_2$, e: $H_2O_2$ and f: $JNO_2$. Local noon is 10:00 UTC.

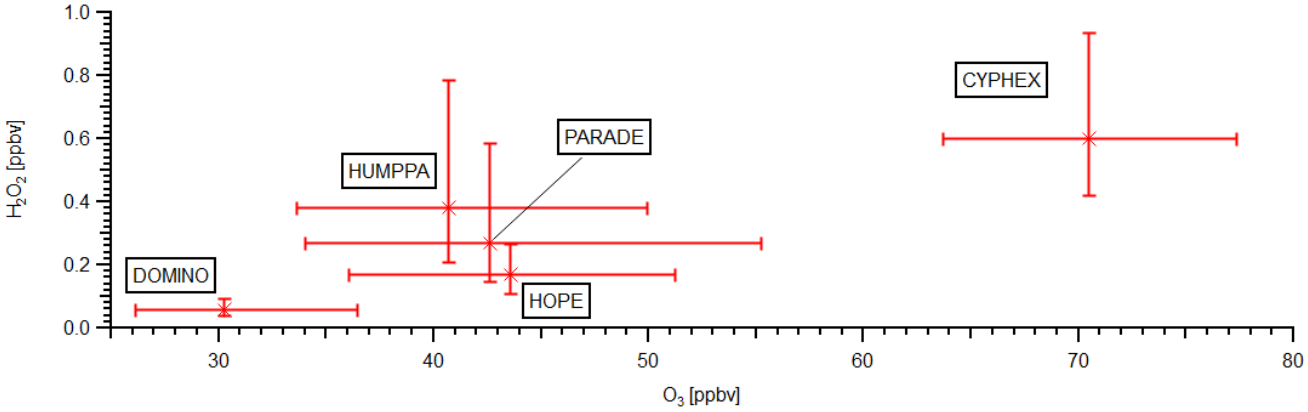



Figure S6: Parameter space ($H_2O_2$ vs. $O_3$) for the five campaigns. Note that all data (day and night) have been used for the calculation of the median values and the 25 – 75 % quartiles.