Flagging Particle Number Size Distribution Data Examples

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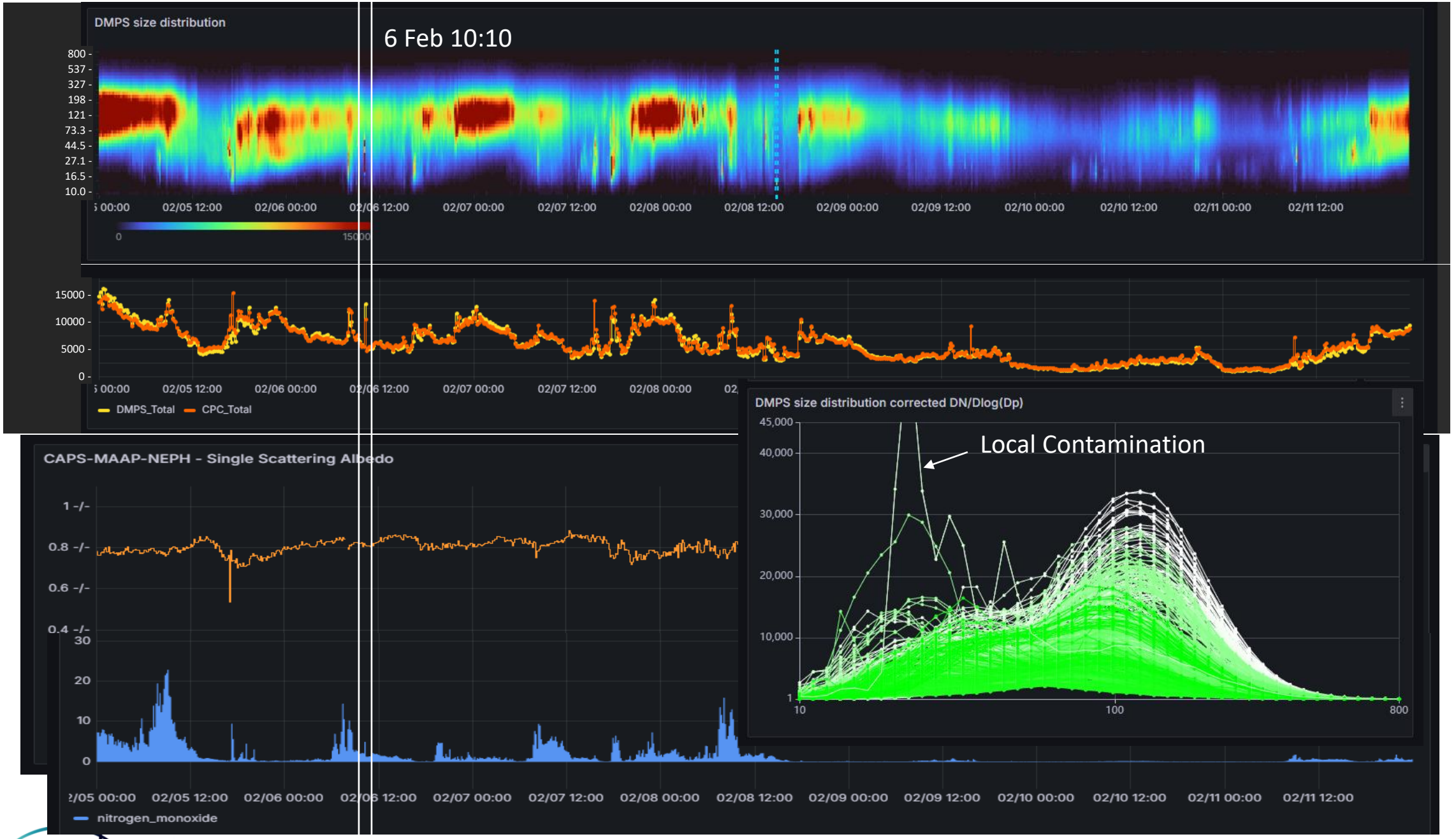
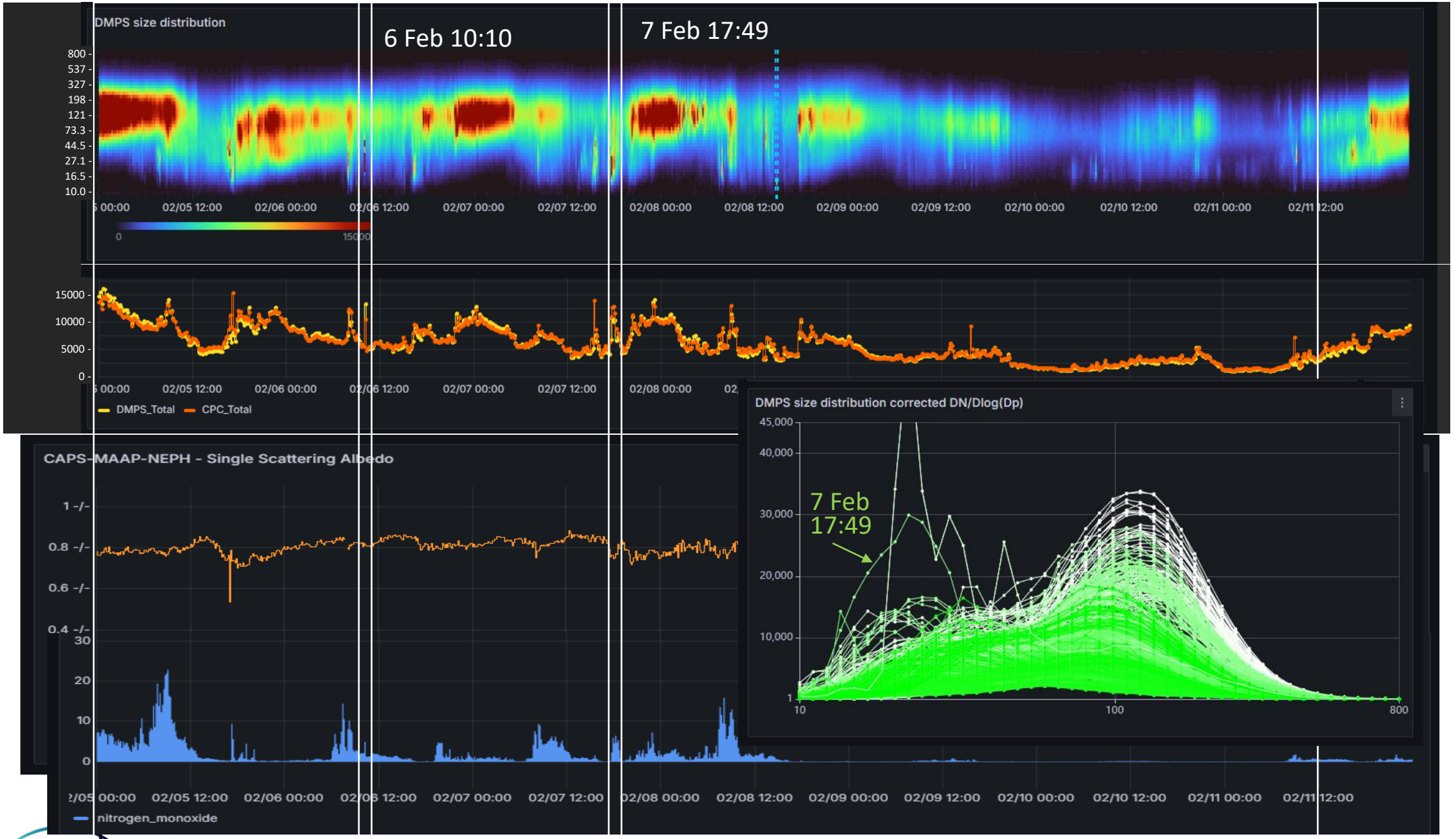
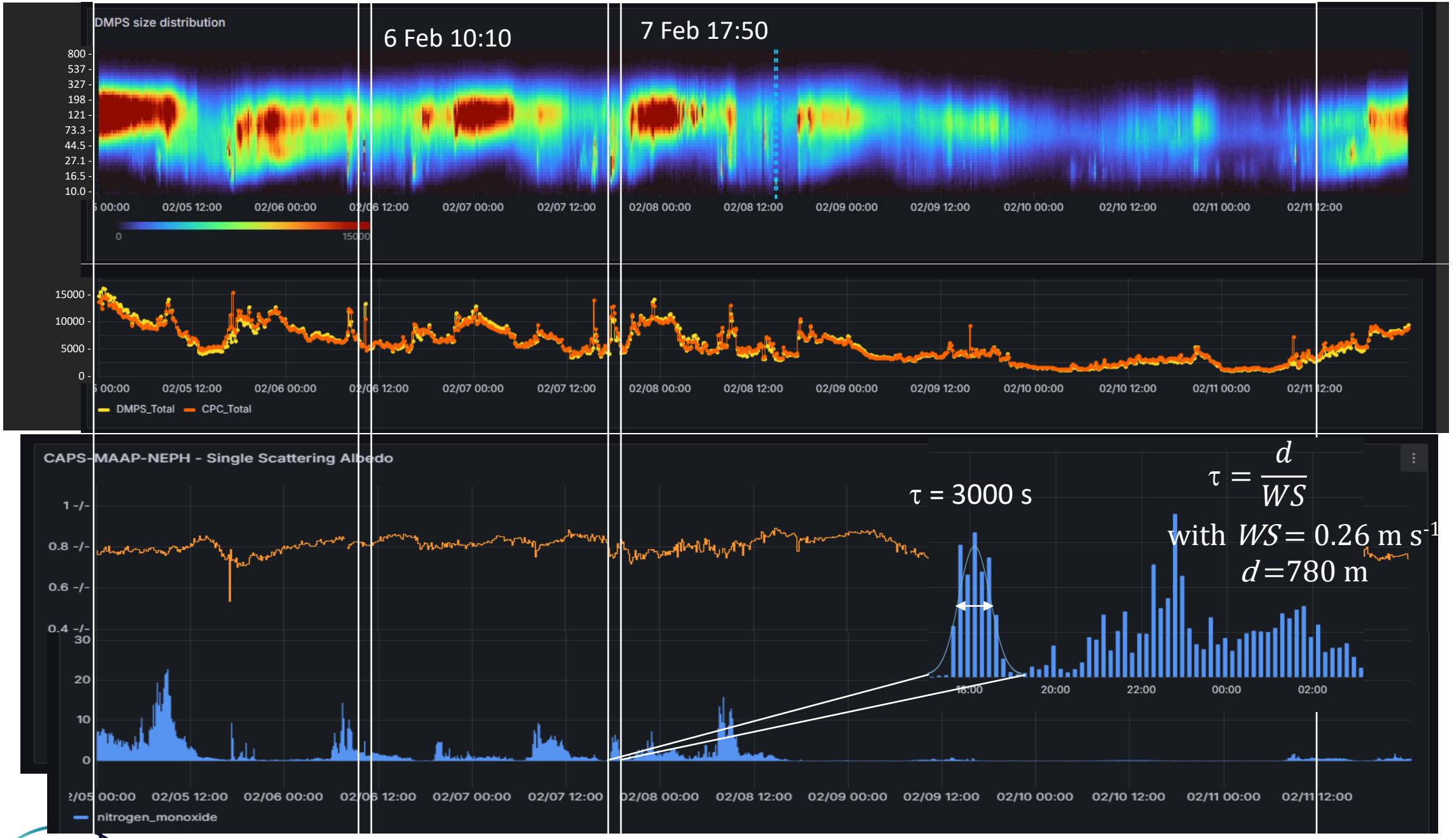
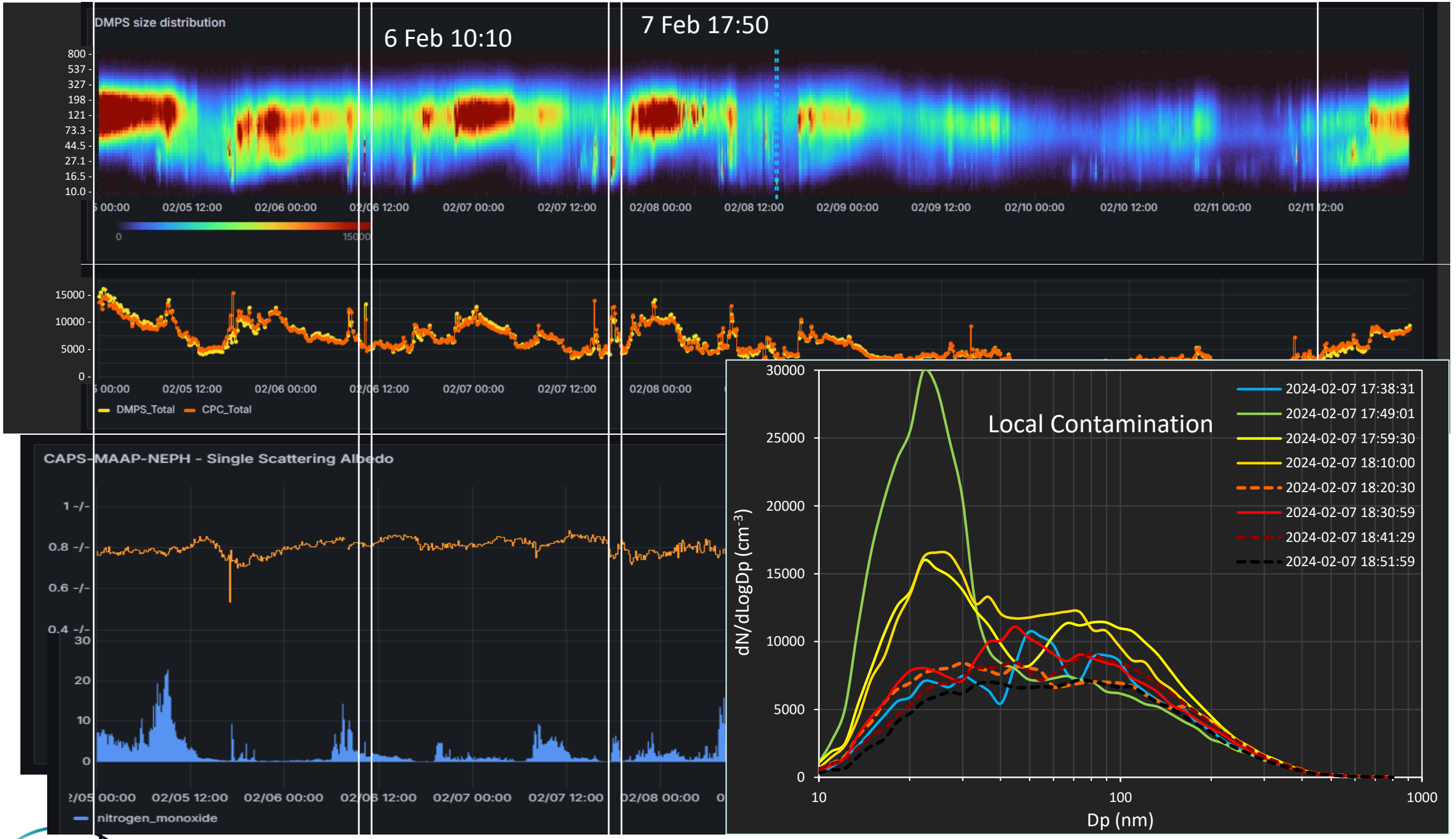
PNSD Data flagging: advice and preamble

1. A flag is a warning message to potential users
2. Log events !
3. Flag Level 0 and 1 data every week (at least)…
4. Don’t flag the various variables independently
5. Local contamination = primary emissions => primarily Aitken mode and… Nitrogen Oxide (NO)
6. Local contamination in PNSD best seen on contour plots (if color scale properly set), but Particle Number Concentrations should be looked at too.

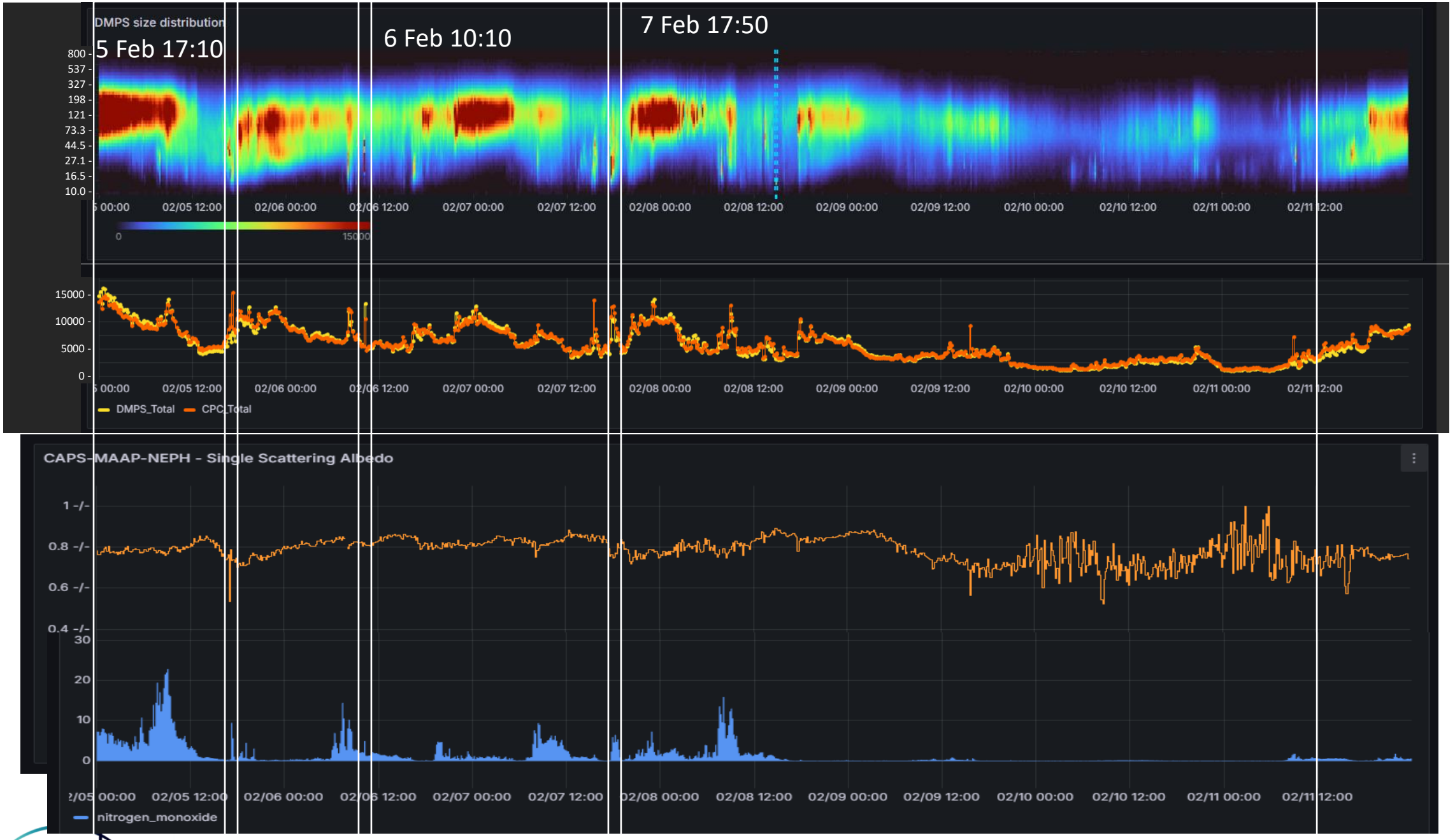

DMPS size distribution
6 Feb 10:10
800 -
537 -
327 -
198 -
121 -
73.3 -
44.5 -
27.1 -
16.5 -
10.0 -
02/05 12:00
02/06 00:00
02/06 12:00
02/07 00:00
02/07 12:00
02/08 00:00
02/08 12:00
02/09 00:00
02/09 12:00
02/10 00:00
02/10 12:00
02/11 00:00
02/11 12:00
0
15000
15000 -
10000 -
5000 -
0 -
DMPS_Total
CPC_Total
DMPS size distribution corrected DN/Dlog(Dp)
45,000
40,000
30,000
20,000
10,000
1
10
100
800
Local Contamination
CAPS-MAAP-NEPH - Single Scattering Albedo
1 -/-
0.8 -/-
0.6 -/-
0.4 -/-
30
20
10
0
nitrogen_monoxide

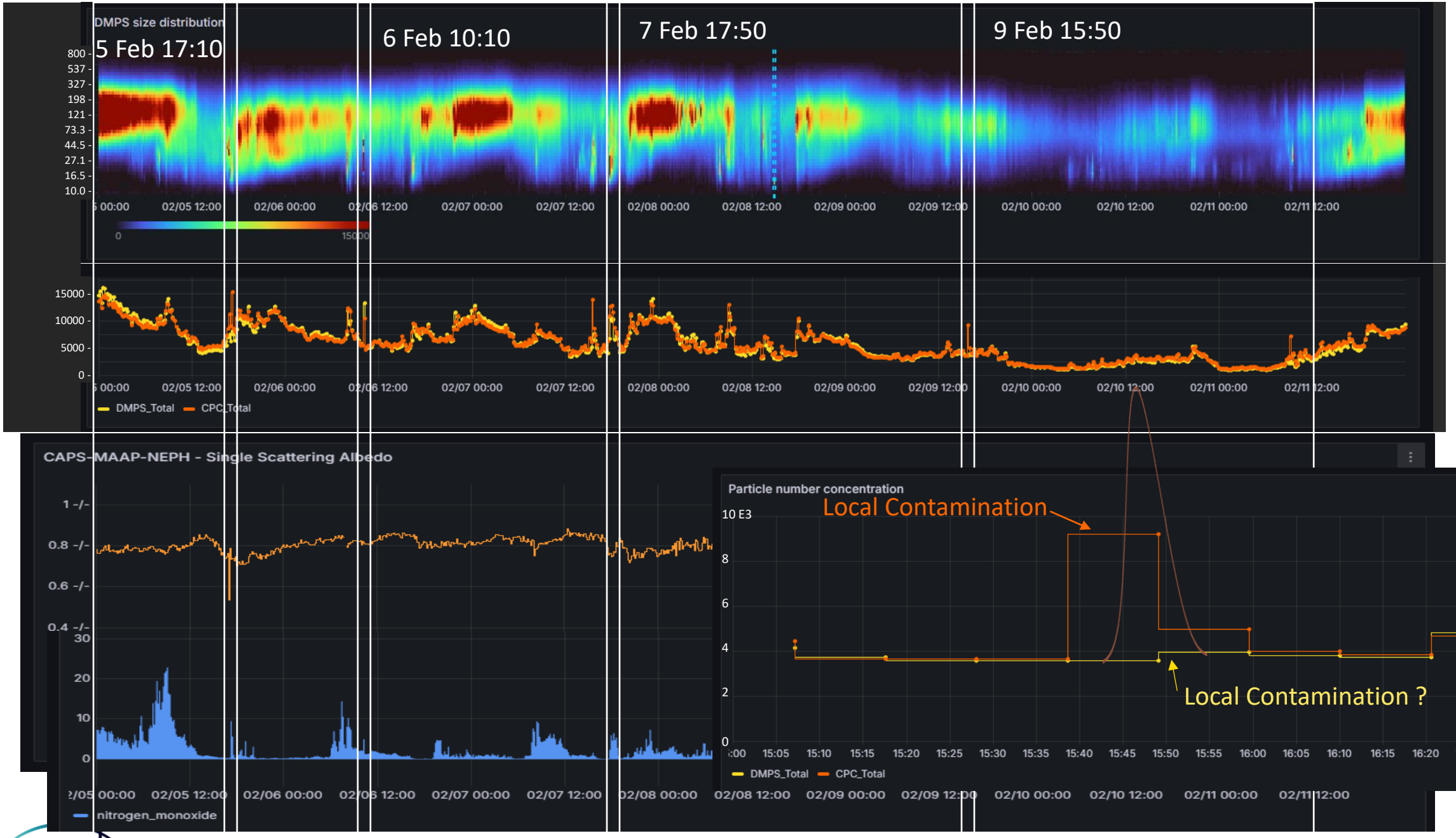

DMPS size distribution
6 Feb 10:10
7 Feb 17:49
800
537
327
198
121
73.3
44.5
27.1
16.5
10.0
02/05 12:00
02/06 00:00
02/06 12:00
02/07 00:00
02/07 12:00
02/08 00:00
02/08 12:00
02/09 00:00
02/09 12:00
02/10 00:00
02/10 12:00
02/11 00:00
0
15000
DMPS_Total
CPC_Total
DMPS size distribution corrected DN/Dlog(Dp)
45,000
40,000
30,000
20,000
10,000
1
10
100
800
7 Feb
17:49
CAPS-MAAP-NEPH - Single Scattering Albedo
1 -/-
0.8 -/-
0.6 -/-
0.4 -/-
30
20
10
0
nitrogen_monoxide

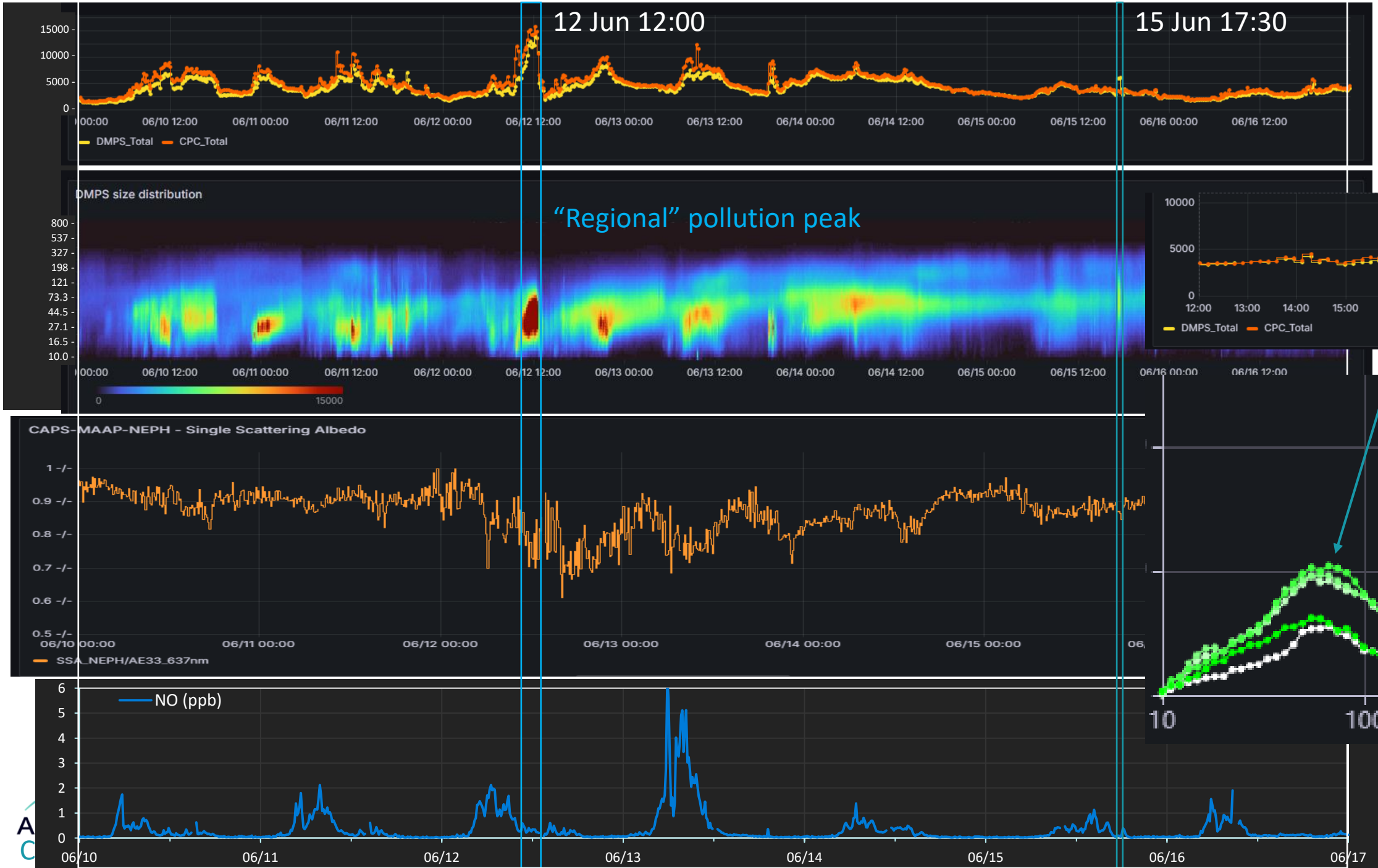

DMPS size distribution
6 Feb 10:10
7 Feb 17:50
800
537
327
198
121
73.3
44.5
27.1
16.5
10.0
02/05 12:00
02/06 00:00
02/07 00:00
02/07 12:00
02/08 00:00
02/08 12:00
02/09 00:00
02/09 12:00
02/10 00:00
02/10 12:00
02/11 00:00
0
15000
DMPS_Total
CPC_Total
CAPS-MAAP-NEPH - Single Scattering Albedo
1 -/-
0.8 -/-
0.6 -/-
0.4 -/-
30
20
10
0
nitrogen_monoxide
τ = 3000 s
$\tau = \frac{d}{WS}$
with $WS = 0.26$ m s^{-1}
$d = 780$ m
18:00
20:00
22:00
00:00
02:00

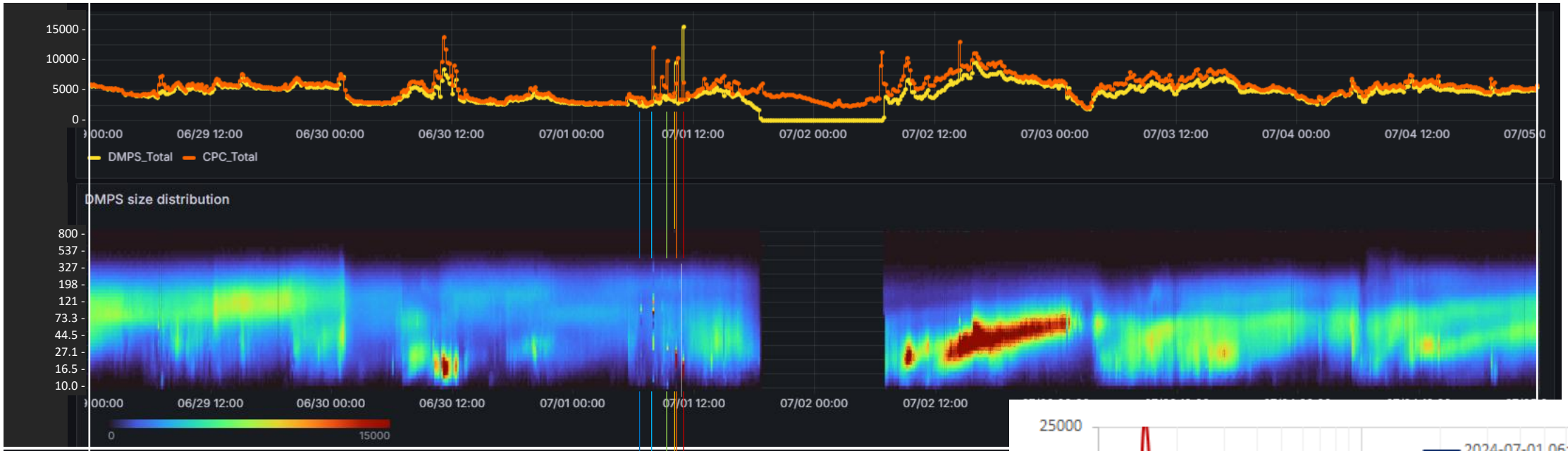


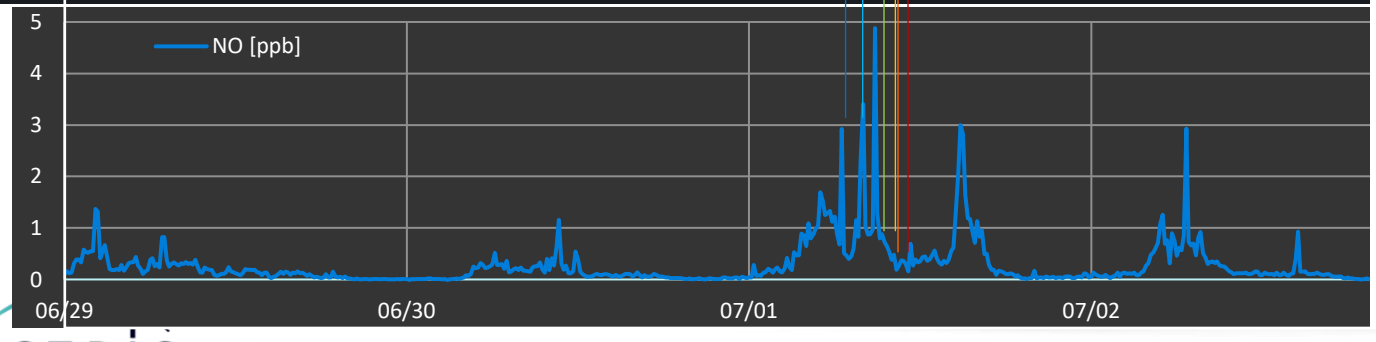
ACTRIS CAIS-ECAC

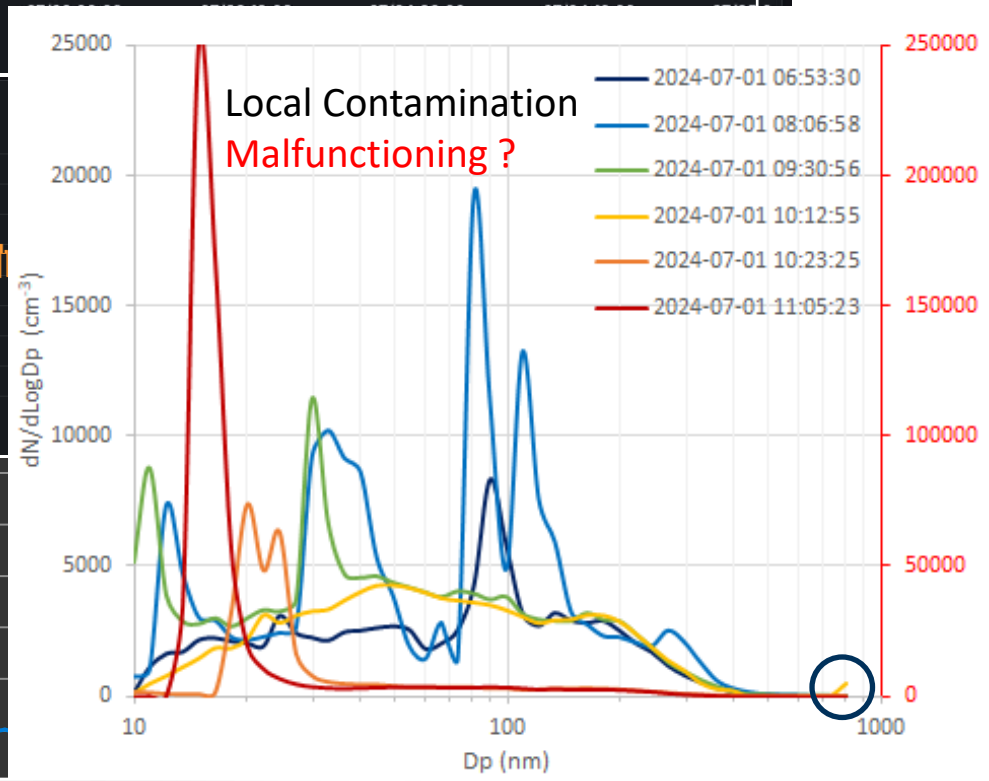

DMPS size distribution
5 Feb 17:10
6 Feb 10:10
7 Feb 17:50
800
537
327
198
121
73.3
44.5
27.1
16.5
10.0
02/05 12:00
02/06 00:00
02/06 12:00
02/07 00:00
02/07 12:00
02/08 00:00
02/08 12:00
02/09 00:00
02/09 12:00
02/10 00:00
02/10 12:00
02/11 00:00
0
15000
DMPS_Total
CPC_Total
CAPS-MAAP-NEPH - Single Scattering Albedo
1 -/-
0.8 -/-
0.6 -/-
0.4 -/-
30
20
10
nitrogen_monoxide


DMPS size distribution
5 Feb 17:10
6 Feb 10:10
7 Feb 17:50
9 Feb 15:50
800
537
327
198
121
73.3
44.5
27.1
16.5
10.0
02/05 12:00
02/06 00:00
02/06 12:00
02/07 00:00
02/07 12:00
02/08 00:00
02/08 12:00
02/09 00:00
02/09 12:00
02/10 00:00
02/10 12:00
02/11 00:00
0
15000
15000
10000
5000
0
DMPS_Total
CPC_Total
CAPS-MAAP-NEPH - Single Scattering Albedo
1 -/-
0.8 -/-
0.6 -/-
0.4 -/-
30
20
10
0
nitrogen_monoxide
Particle number concentration
10 E3
8
6
4
2
0
Local Contamination
Local Contamination ?
15:05
15:10
15:15
15:20
15:25
15:30
15:35
15:40
15:45
15:50
15:55
16:00
16:05
16:10
16:15
16:20
16:25
16:30
16:35

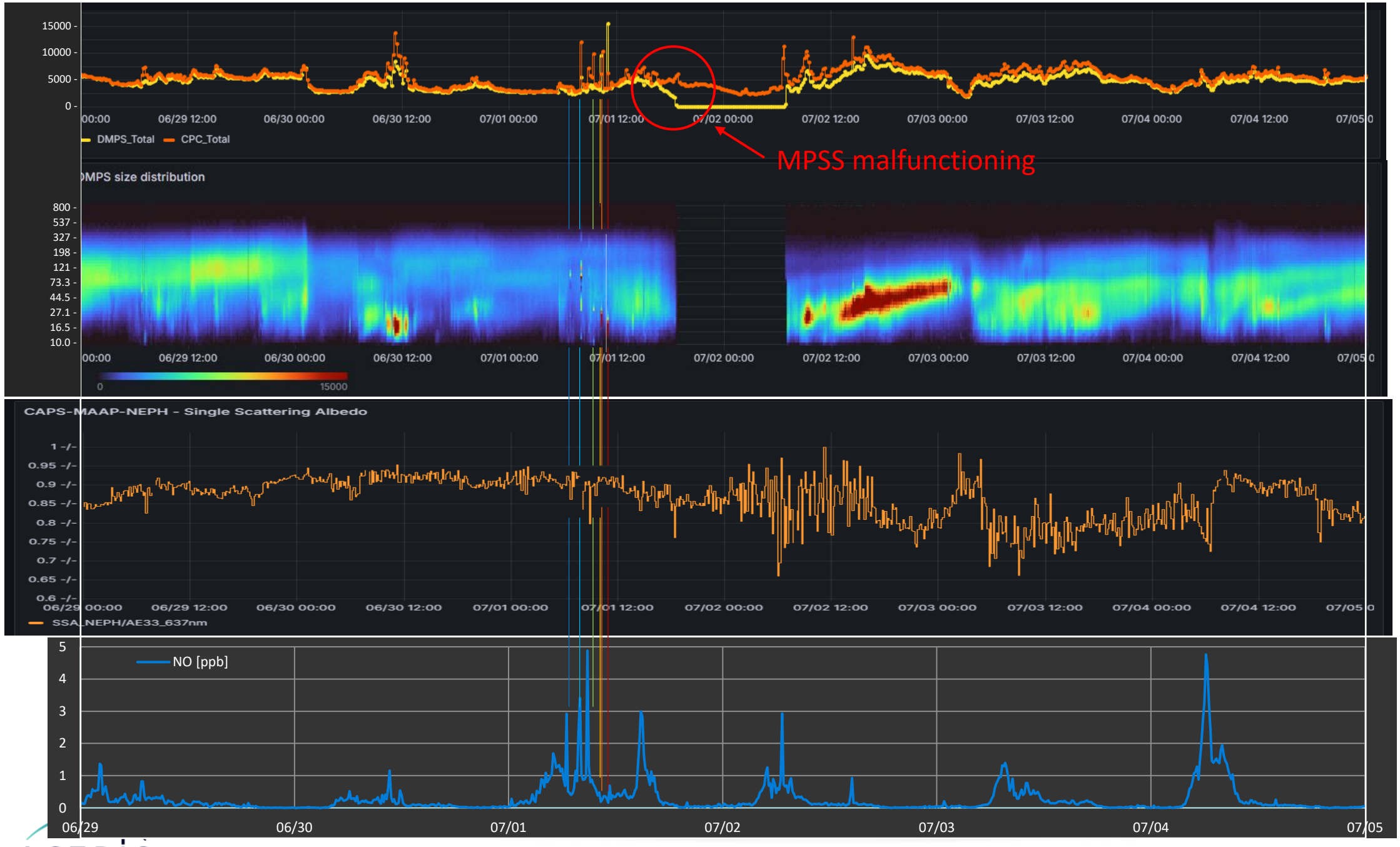

12 Jun 12:00
15 Jun 17:30
DMPS_Total
CPC_Total
DMPS size distribution
"Regional" pollution peak
ZOOM
Rain Shower
PNSDs
CAPS-MAAP-NEPH - Single Scattering Albedo
SSA_NEPH/AE33_637nm
NO (ppb)







ACTRIS
CAIS-ECAC


15000
10000
5000
0
DMPS_Total
CPC_Total
MPSS malfunctioning
DMPS size distribution
800
537
327
198
121
73.3
44.5
27.1
16.5
10.0
0
15000
CAPS-MAAP-NEPH - Single Scattering Albedo
1 -/-
0.95 -/-
0.9 -/-
0.85 -/-
0.8 -/-
0.75 -/-
0.7 -/-
0.65 -/-
0.6 -/-
SSA_NEPH/AE33_637nm
NO [ppb]
5
4
3
2
1
0
06/29
06/30
07/01
07/02
07/03
07/04
07/05

Conclusions

1. Flagging sometimes results from an “educated guess”
2. It is certainly “flagger” dependent
3. Flagging would probably be more consistent if done by a machine….

Thank you

QUESTIONS ?