Tunable Diode Laser Measurements of CH_2O During TRACE-P

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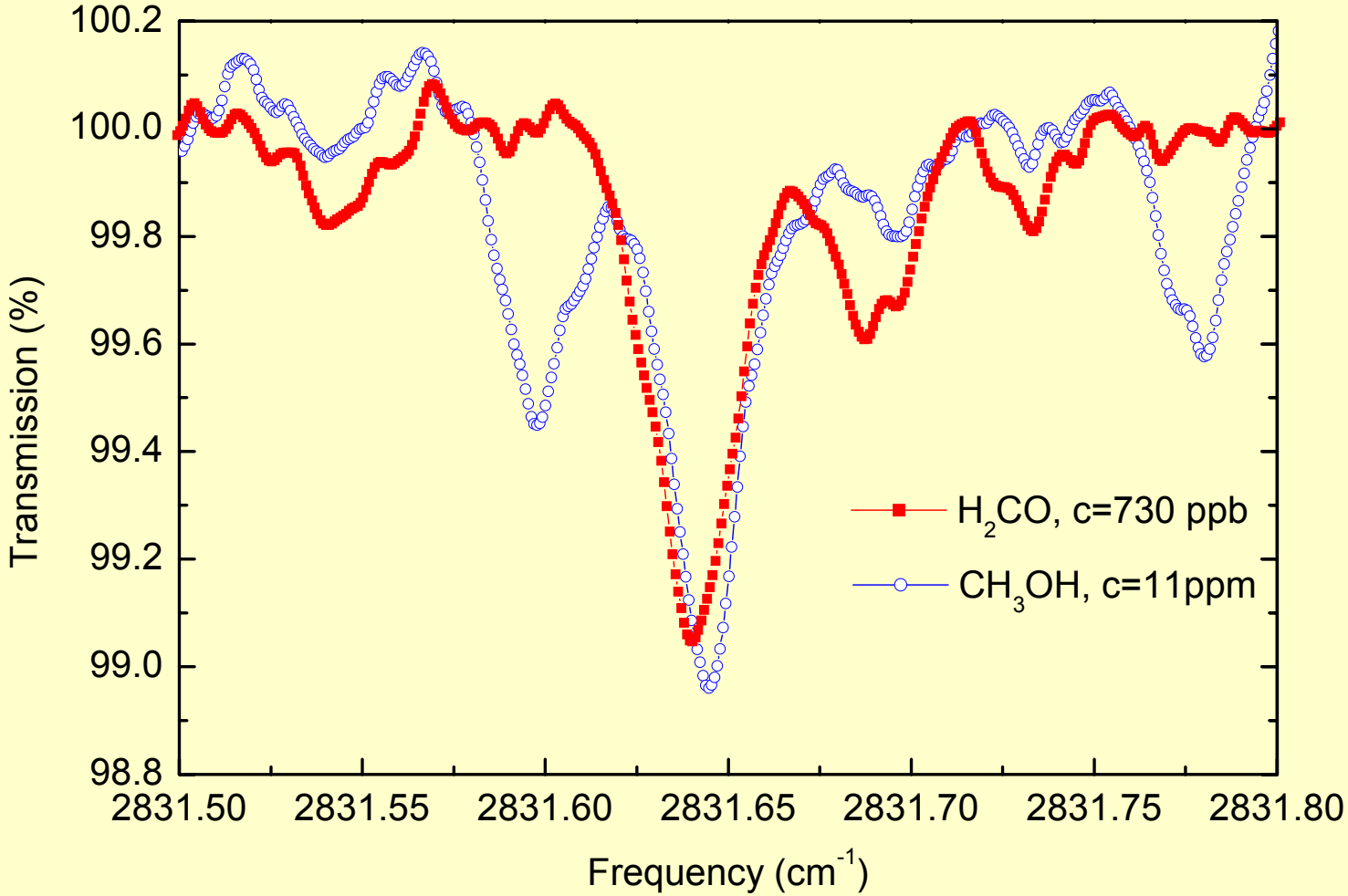
Data Status

- Preliminary 1-minute data for all the flights in the archive (7015/8745 =80% coverage).
- In the process of performing QC on all the data, applying a small methanol correction, and deriving measurement precision and total uncertainty estimates.
- In the process of assessing which time periods to submit faster data (10 – 20 seconds).

Methanol Interference
From D. Richter's Ph.D. Dissertation



TRACE-P Papers

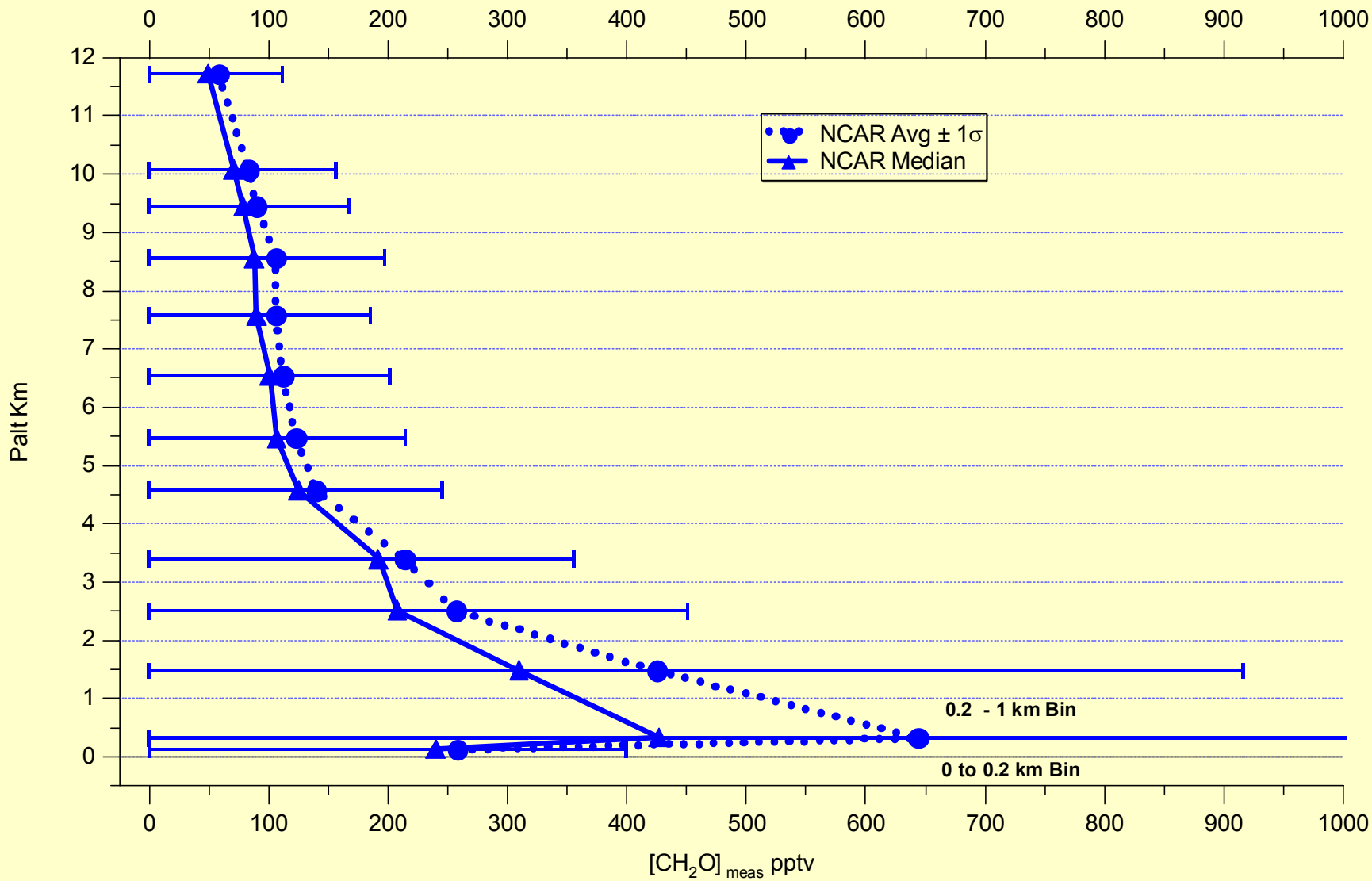
- CH2O distributions, [CH2O] and ratios to various tracers under different Asian outflow regimes, clean background [CH2O] and model comparisons, UT/LS [CH2O] and impact on HOx.

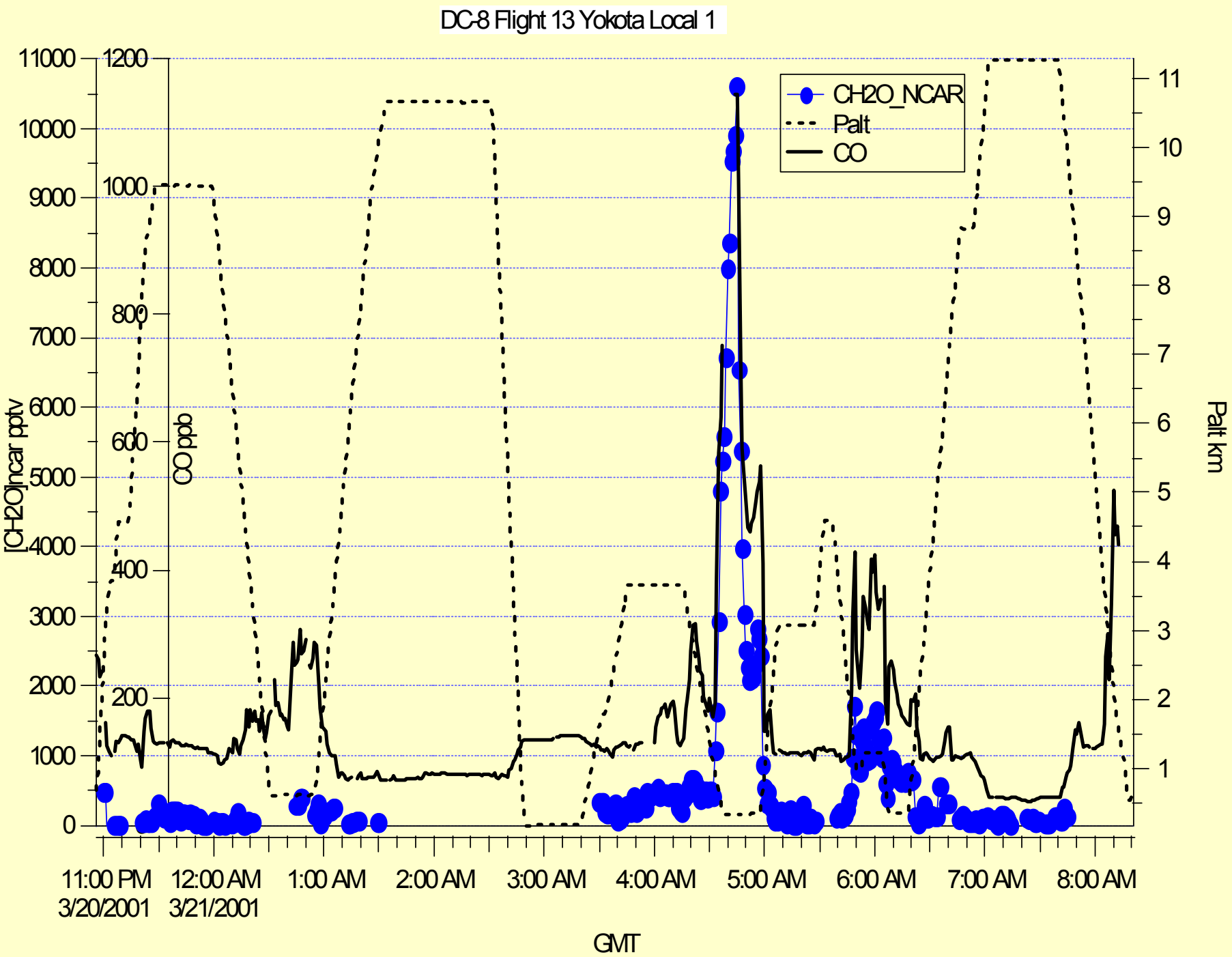
Fried group, Heikes group, Chen, & Jacob's group

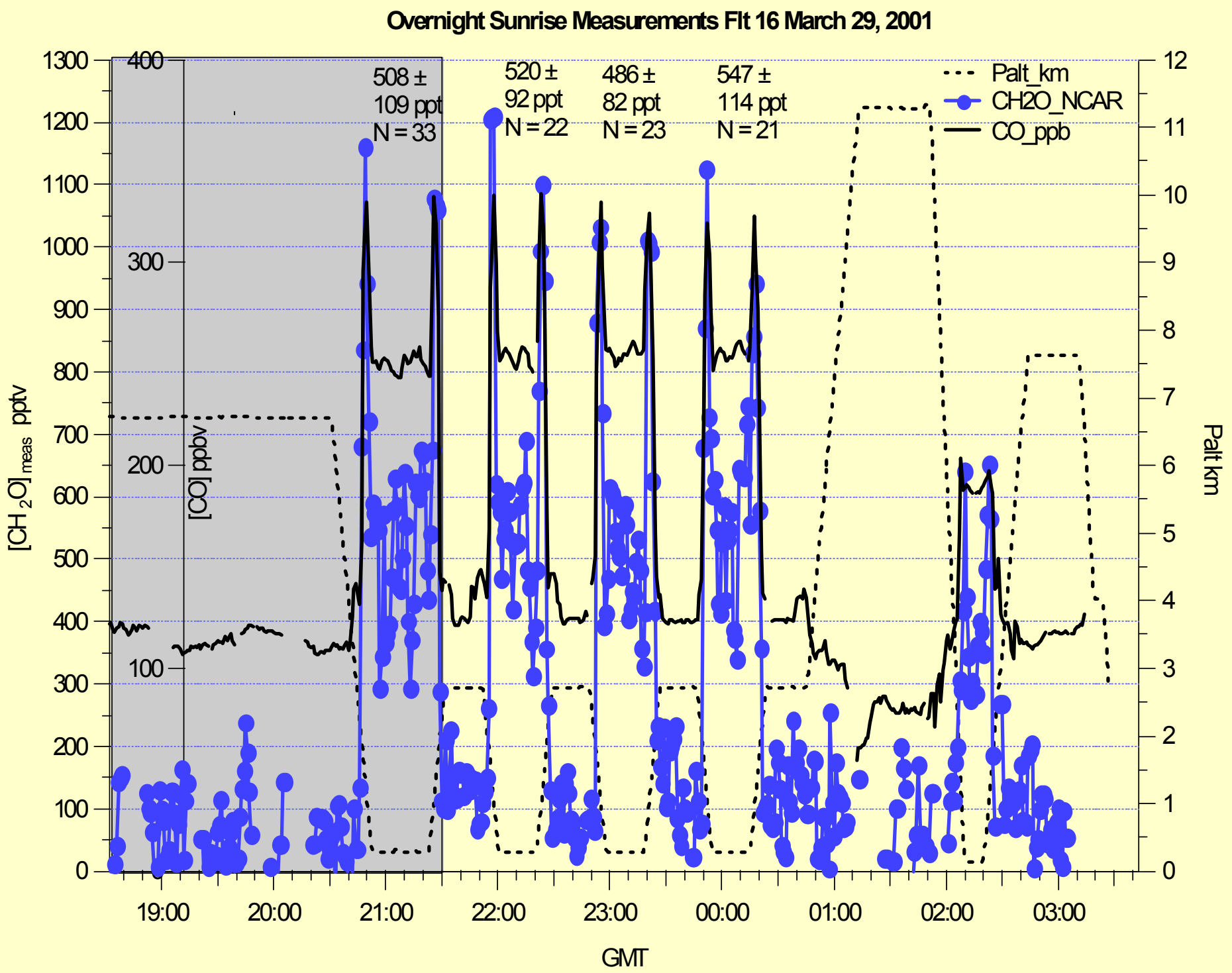
- Oceanic Flux of CH2O & other carbonyls and their relationship with alkene and biogenic precursors.

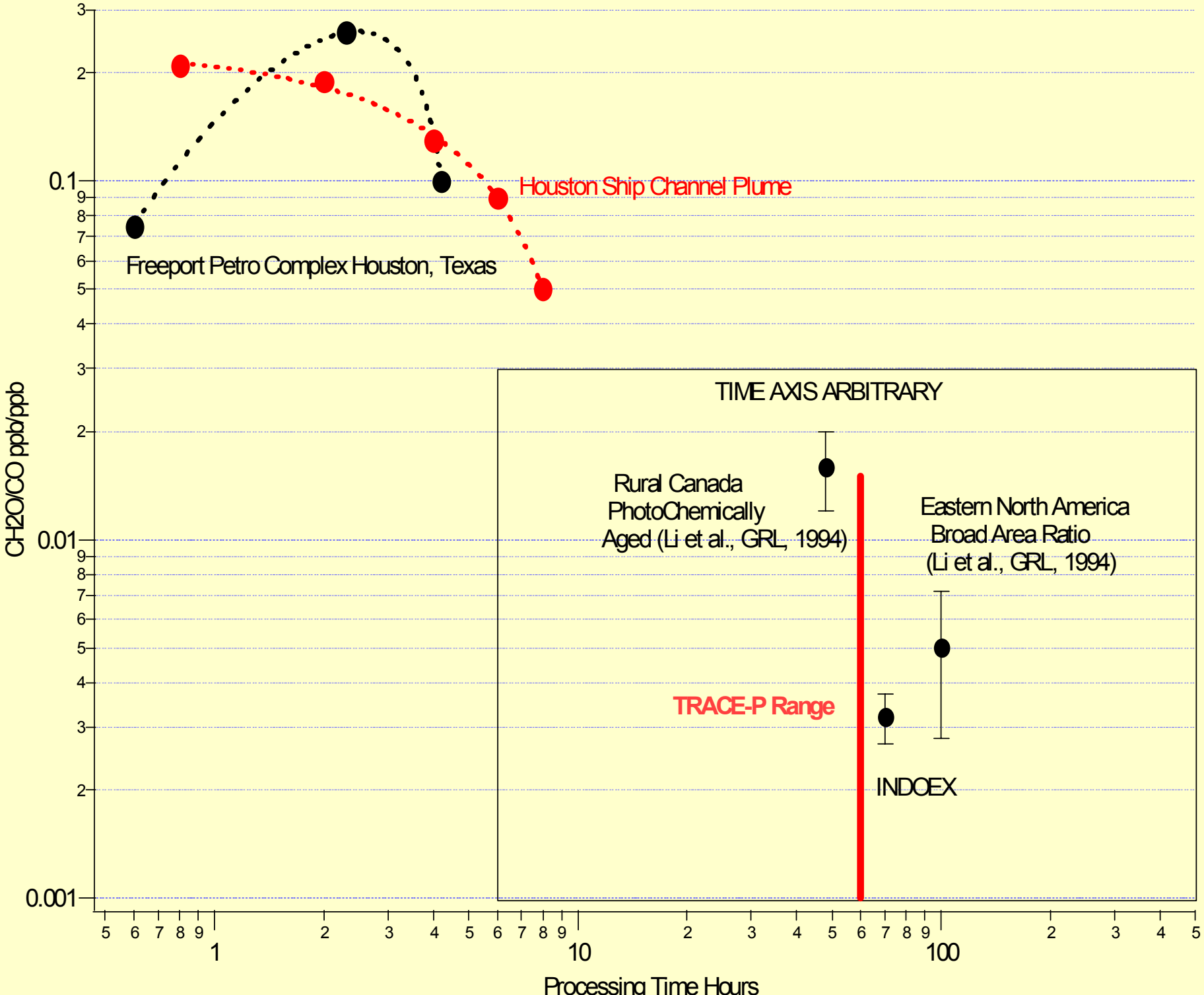
Fried group or Appel/Reimer (TBD)

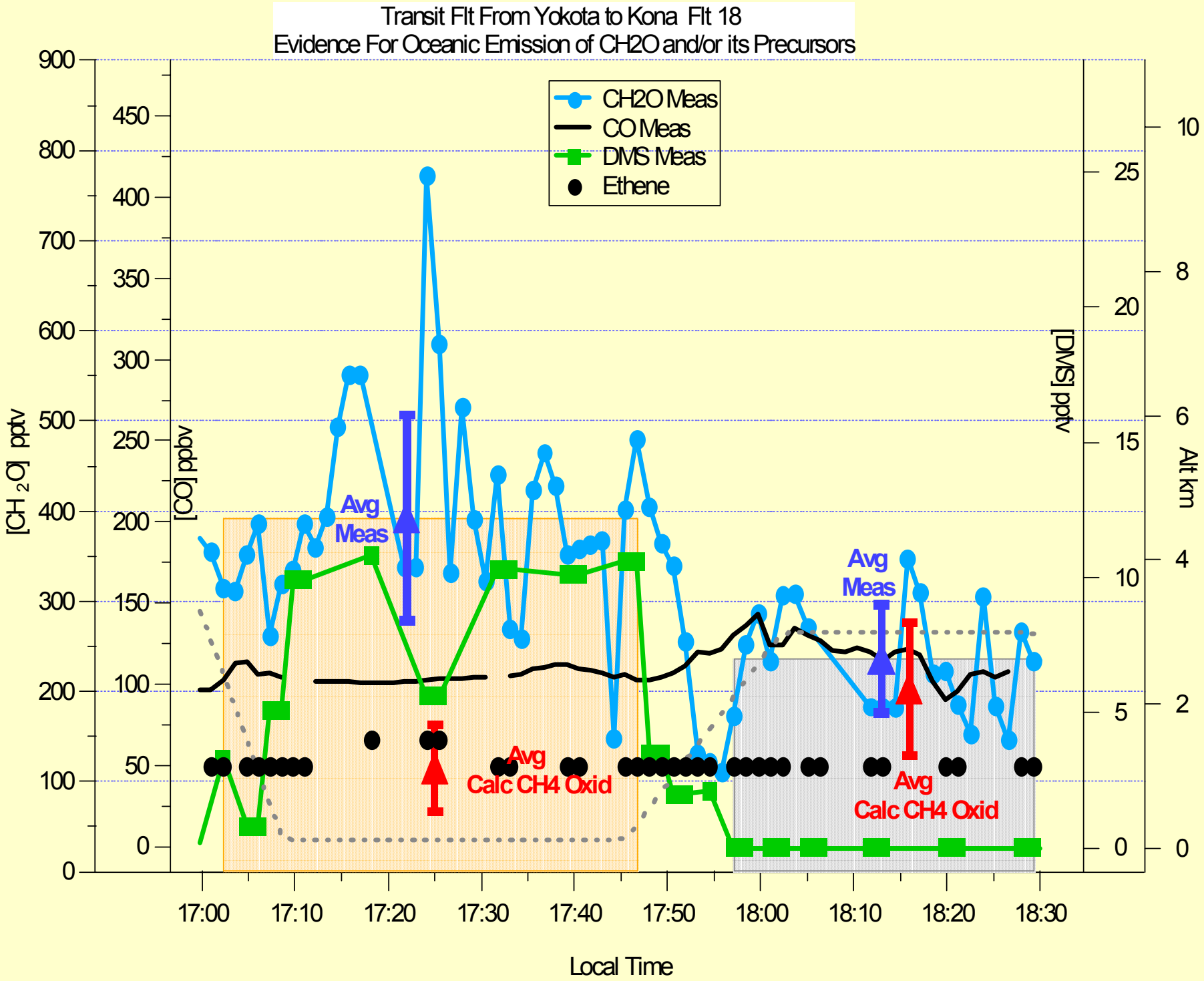
Palt Binned Data

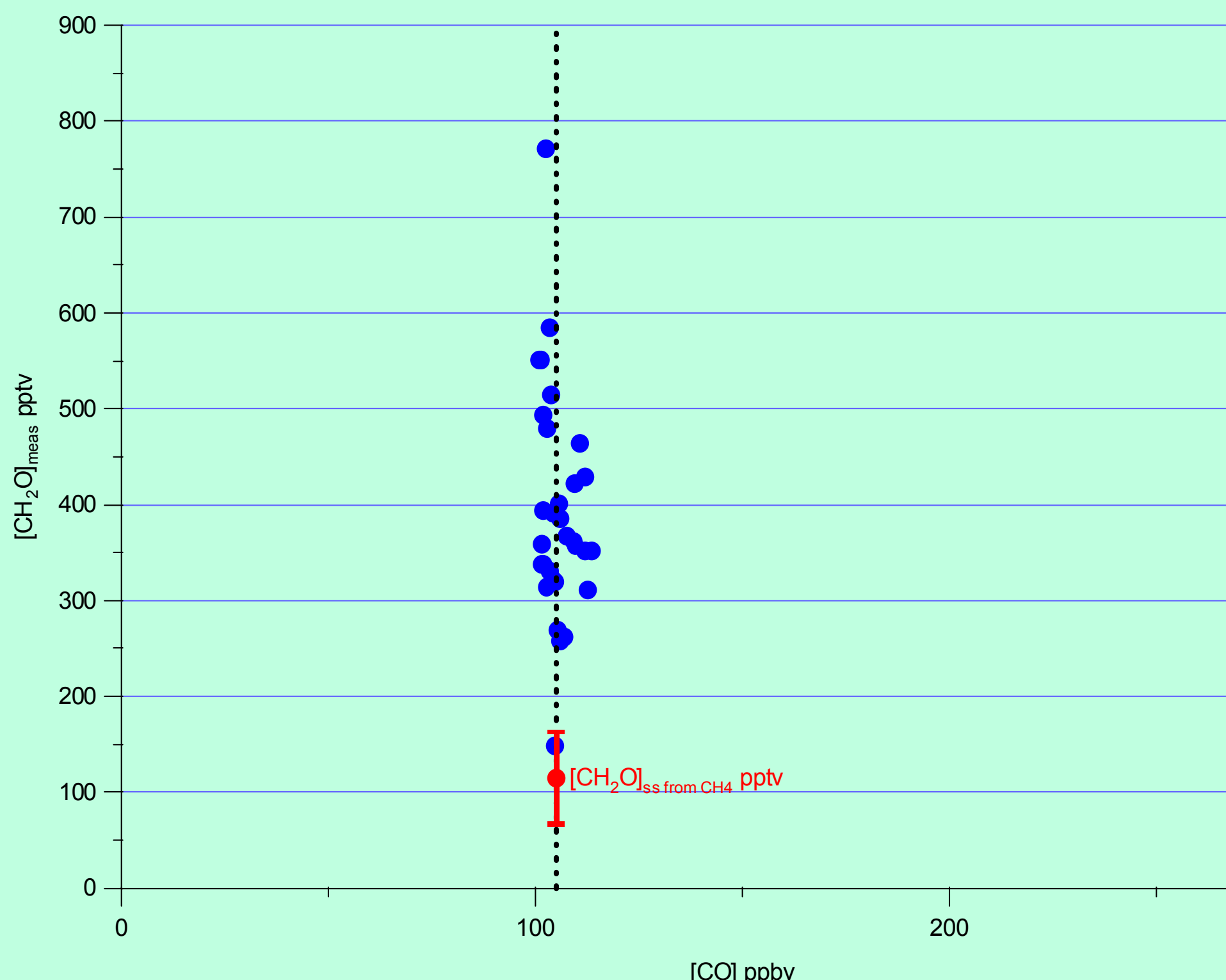



DC-8 Flight 13 Yokota Local 1
CH2O_NCAR
Palt
CO
[CH2O]ncar pptv
CO ppb
Palt km
GMT
11:00 PM 3/20/2001
12:00 AM 3/21/2001
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
200
400
600
800
1000
1200
1
2
3
4
5
6
7
8
9
10
11


Overnight Sunrise Measurements Flt 16 March 29, 2001
508 ± 109 ppt N = 33
520 ± 92 ppt N = 22
486 ± 82 ppt N = 23
547 ± 114 ppt N = 21
Palt_km
CH2O_NCAR
CO_ppb
[CH2O]meas pptv
[CO] ppbv
Palt km
GMT
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00


Houston Ship Channel Plume
Freeport Petro Complex Houston, Texas
TIME AXIS ARBITRARY
Rural Canada
PhotoChemically
Aged (Li et al., GRL, 1994)
Eastern North America
Broad Area Ratio
(Li et al., GRL, 1994)
TRACE-P Range
INDOEX
CH2O/CO ppb/ppb
Processing Time Hours


Transit Flt From Yokota to Kona Flt 18
Evidence For Oceanic Emission of CH2O and/or its Precursors
CH2O Meas
CO Meas
DMS Meas
Ethene
Avg Meas
Avg Calc CH4 Oxid
Avg Meas
Avg Calc CH4 Oxid
[CH 2O] pptv
[CO] ppbv
[DMS] pptv
Alt km
Local Time
17:00
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30


900
800
700
600
500
400
300
200
100
0
$[CH_2O]_{meas}$ pptv
$[CH_2O]_{ss\ from\ CH4}$ pptv
0
100
200
[CO] ppbv

TRACE-P Mission 0 to 2 km BL Relationships
[CH 2O] meas pptv
[CO] ppbv
DMS pptv
Slope All = 0.006 ± 0.0001 ppb/ppb
Intercept = -735 ± 25 pptv
R2 = 0.77
N = 910
0
100
200
300
400
500
600
700
800
900
1000
0
10
20
30
40
50
60