

Ground based GC, Picarro and O₃ measurements on Manus Island



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Geraint Vaughan, Hugo Ricketts, Richard Newton, Charles Chemel
Mae Chu

Ground based measurements on Manus Island

- ARM site (many thanks)
- 2.1° S, 147° E
- February 1 – 24, 2014
- O_3 Peco
- CO_2 , CH_4 , CO Picarro G2401
- VLSL μ -Dirac GC-ECD

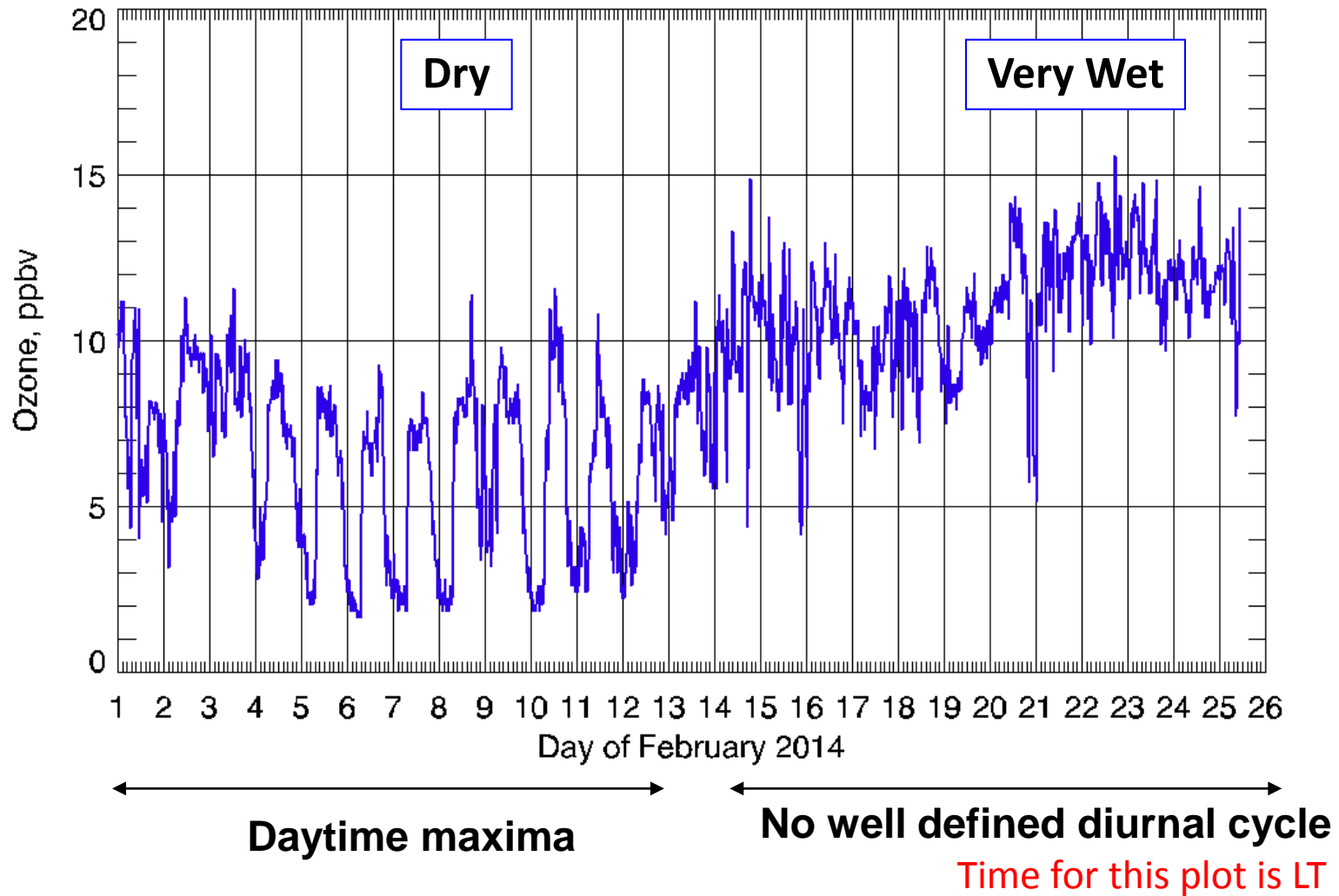


Ground based measurements on Manus Island

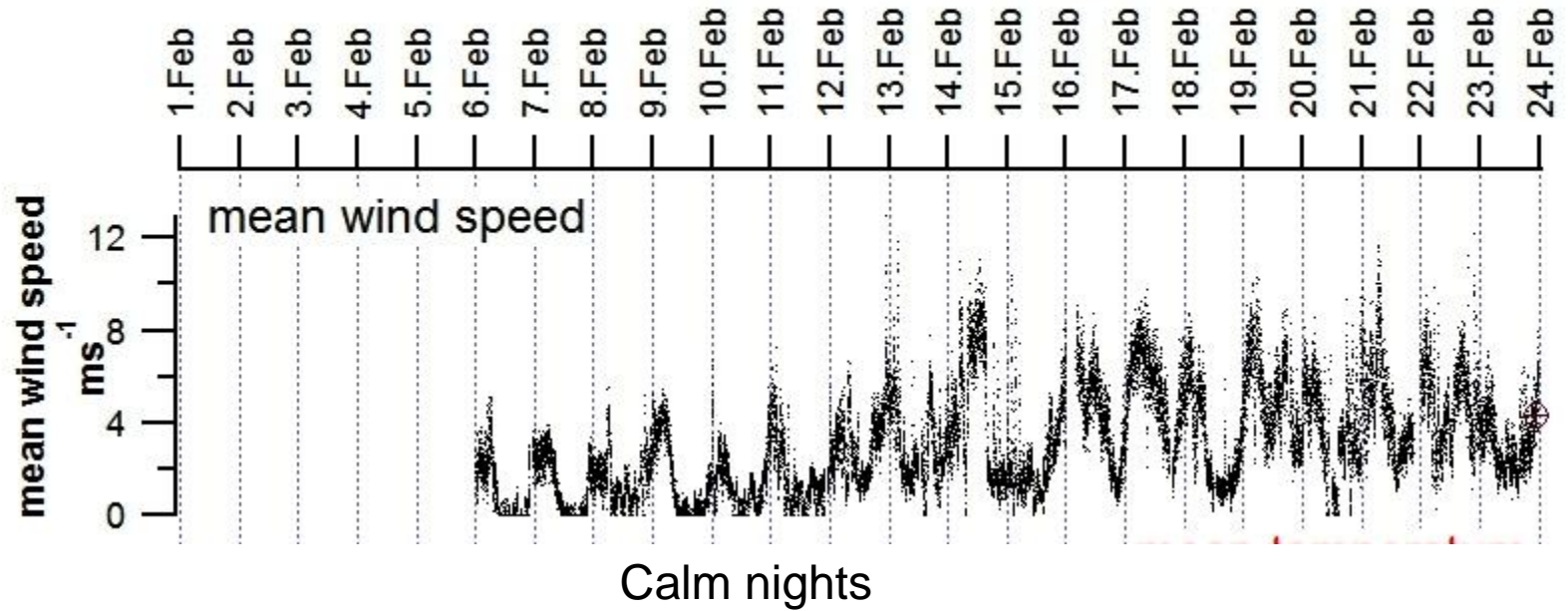


TECO O₃ measurements on Manus Island

Ground-level ozone measured by TECO in Manus

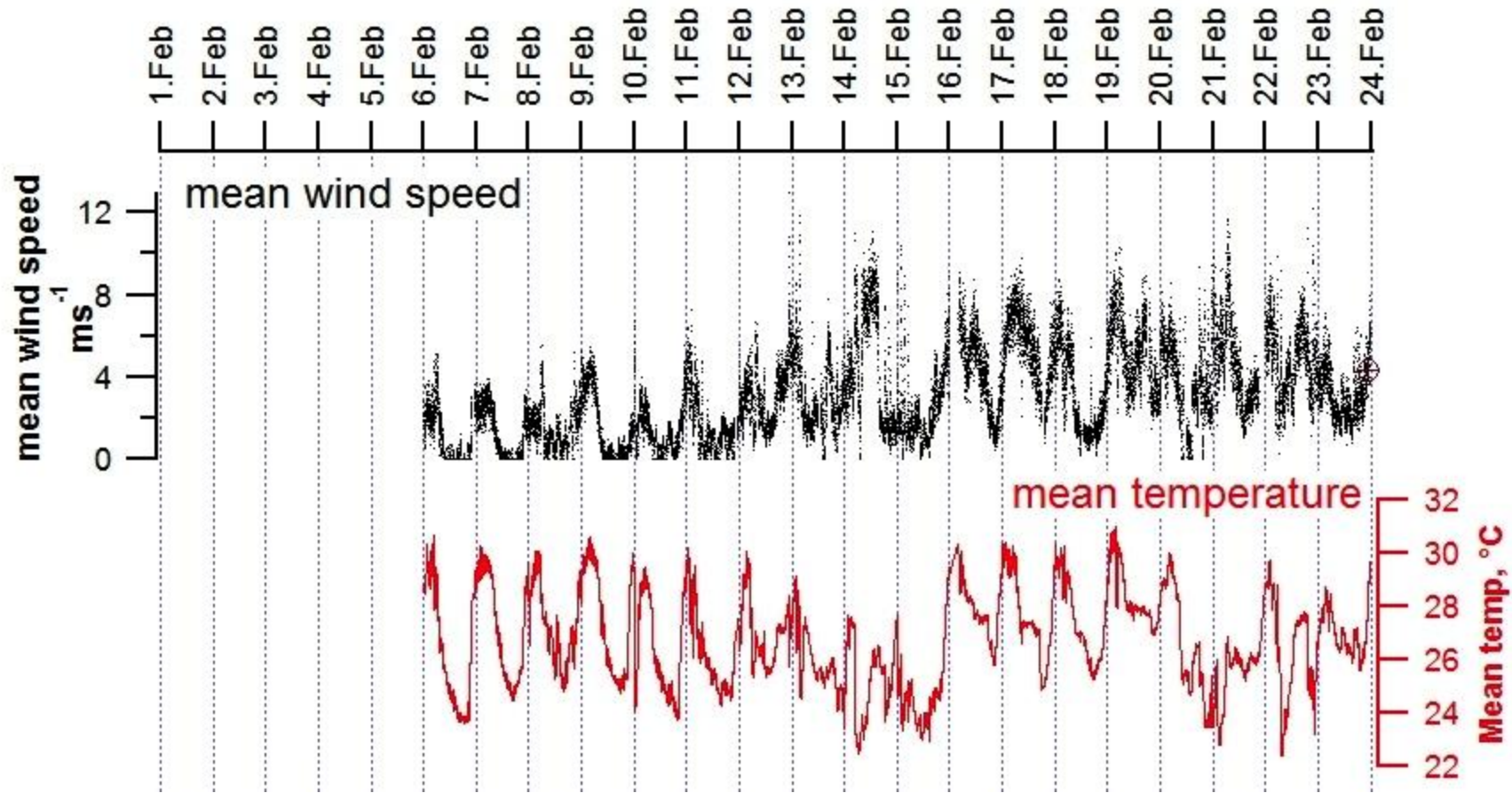


Ground meteorology on Manus Island



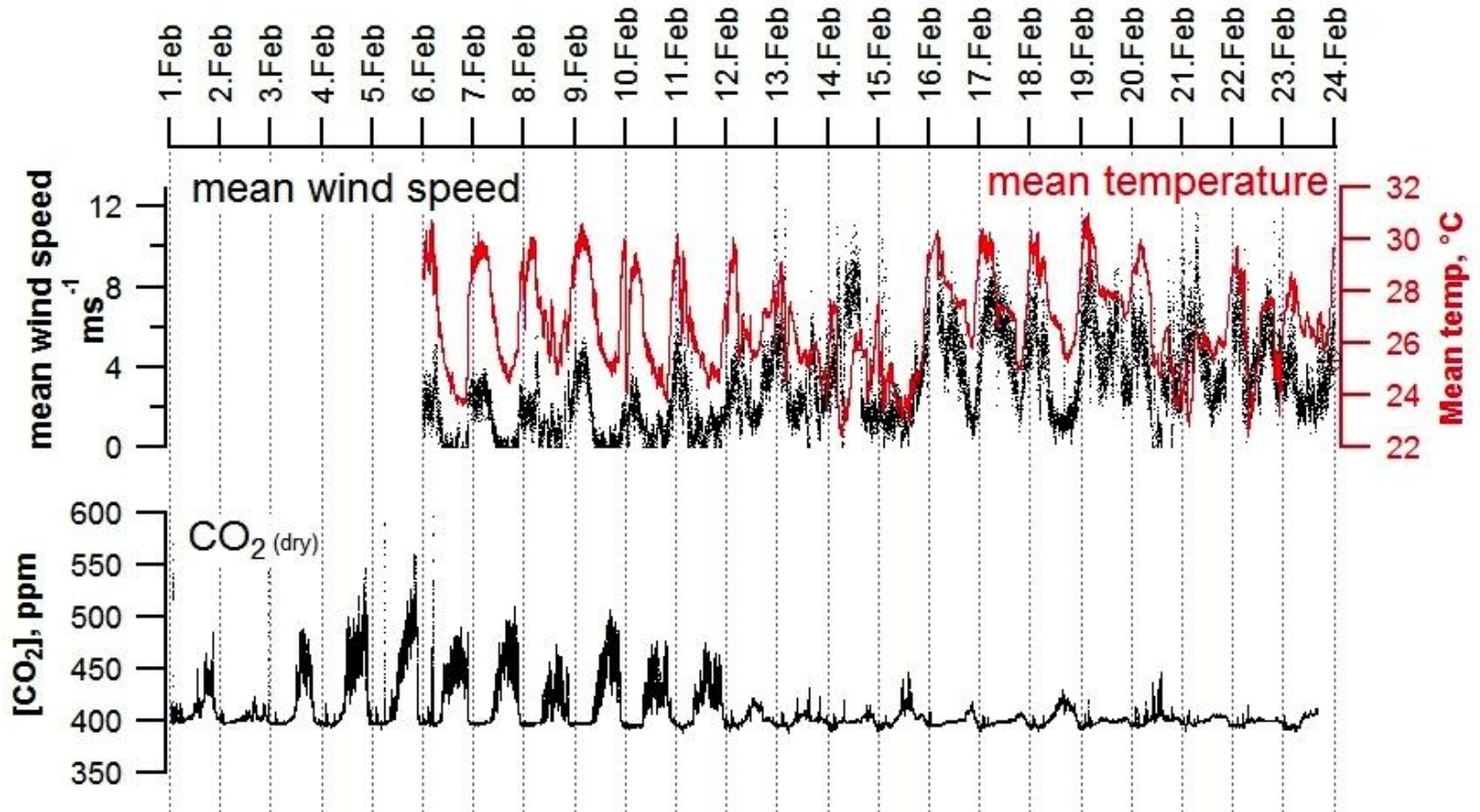
Times are all UT
(add 10 hours for local time)

Ground meteorology on Manus Island



Times are all UT
(add 10 hours for local time)

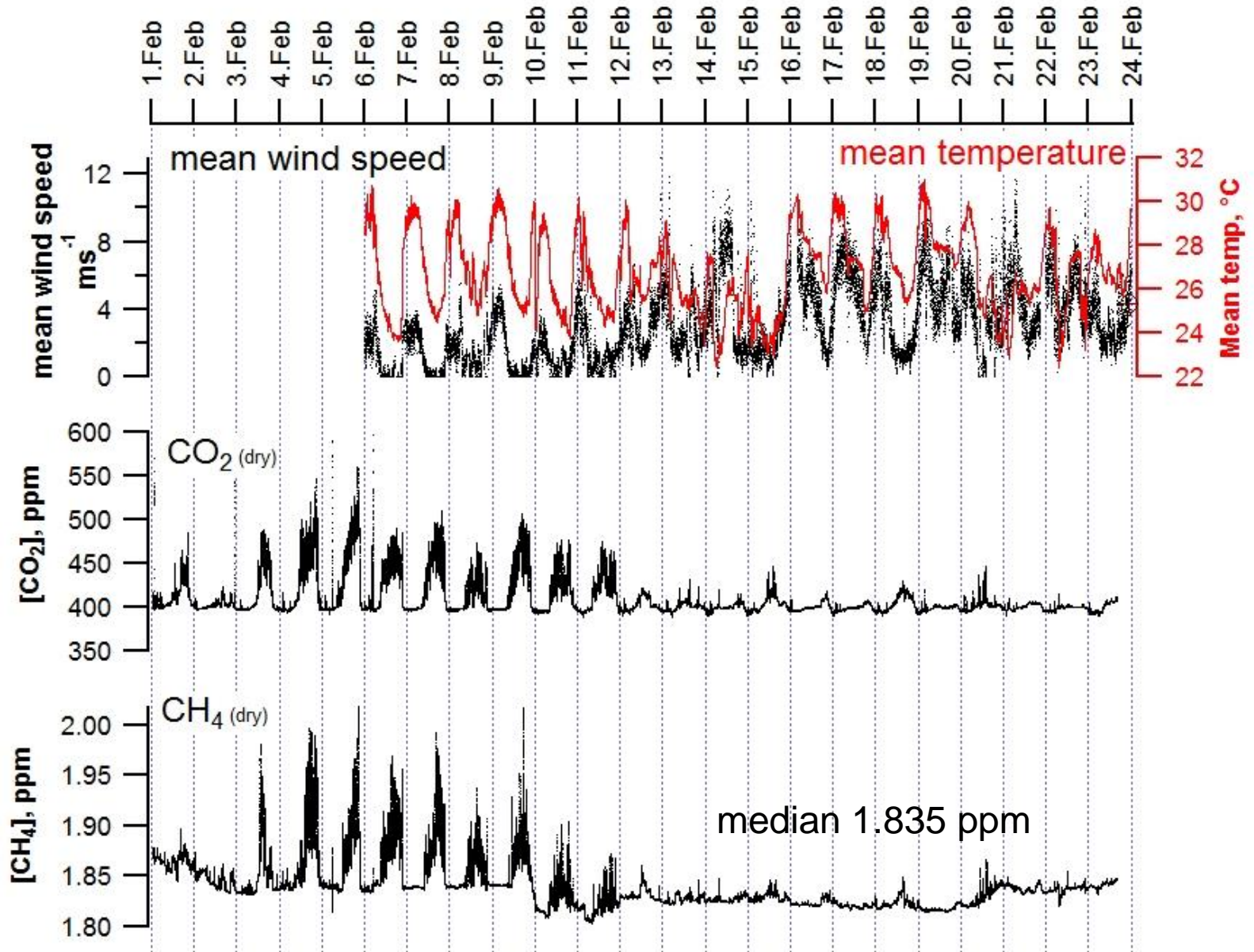
Picarro measurements on Manus Island



Times are all UT
(add 10 hours for local time)

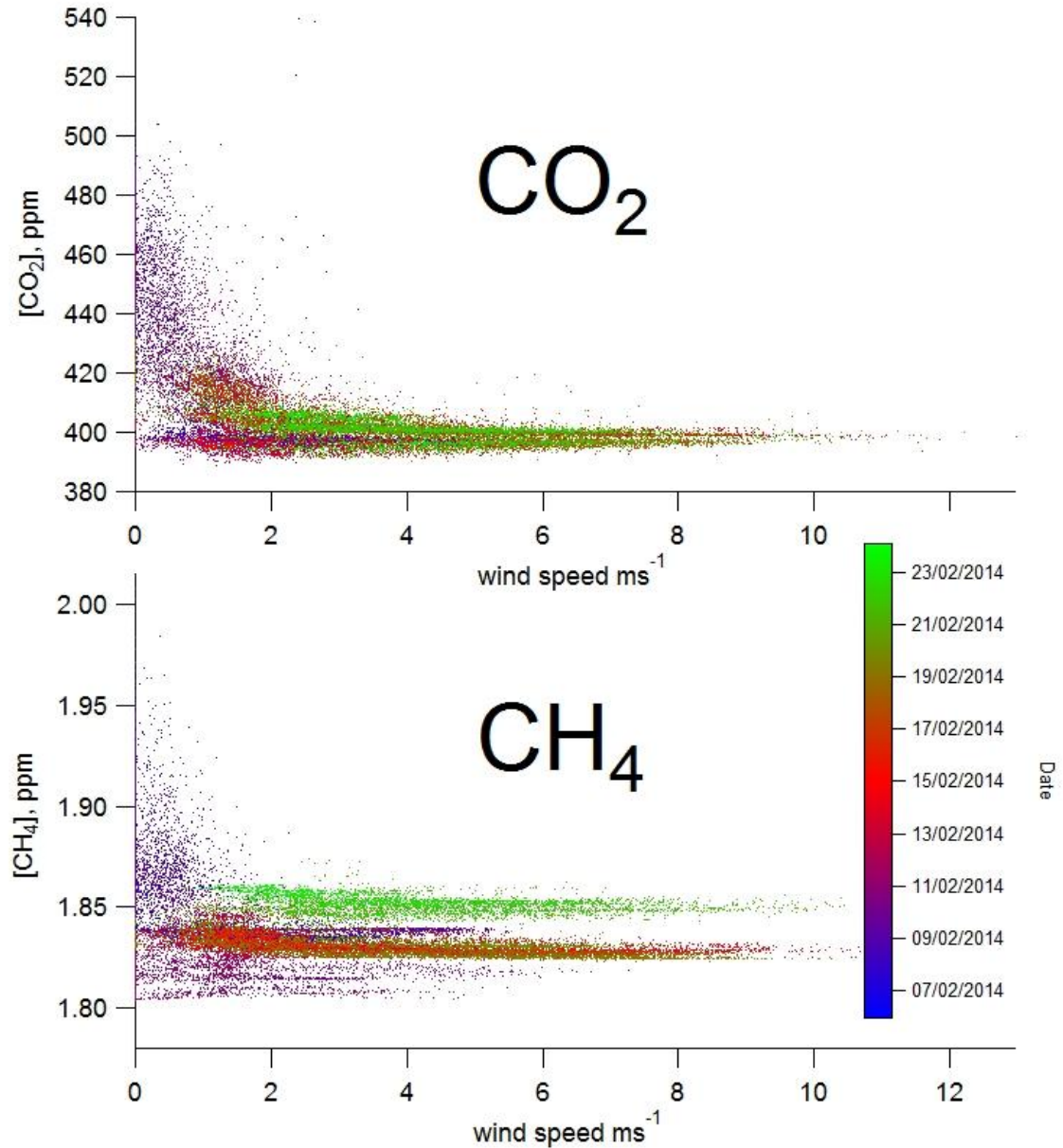
Picarro measurements on Manus Island

Times are all UT



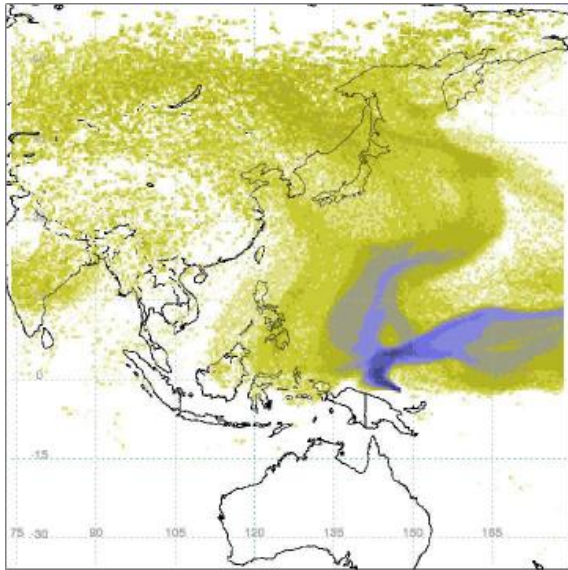
CO₂, CH₄ vs wind speed

Few elevated values at higher wind speed

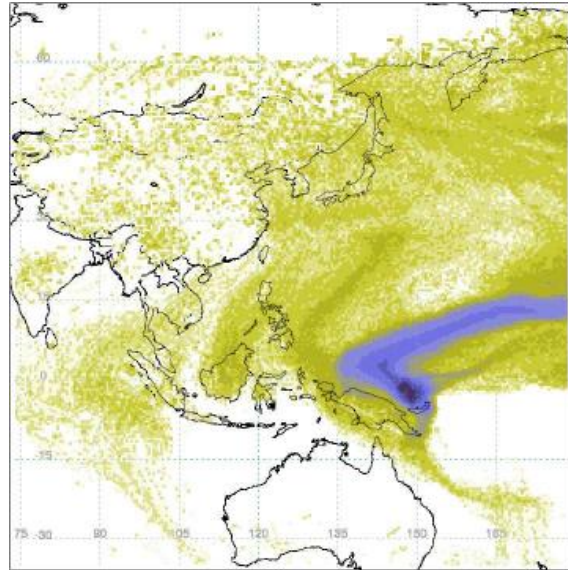


NAME particle density maps for 12 day back-trajectories: 0-100m, 1200-1500 UT

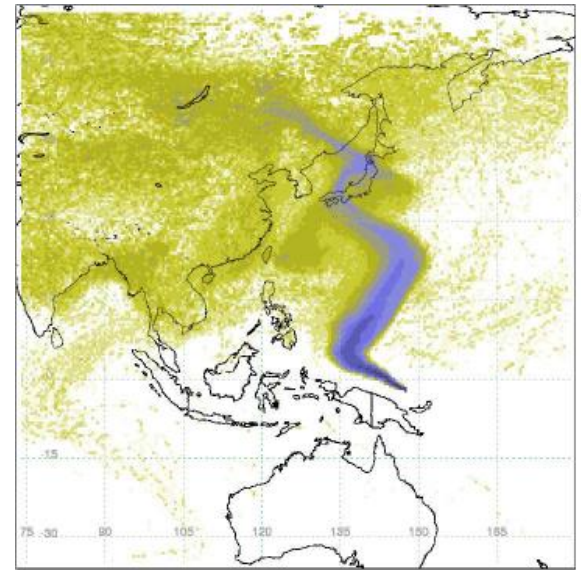
Feb 2



Feb 10



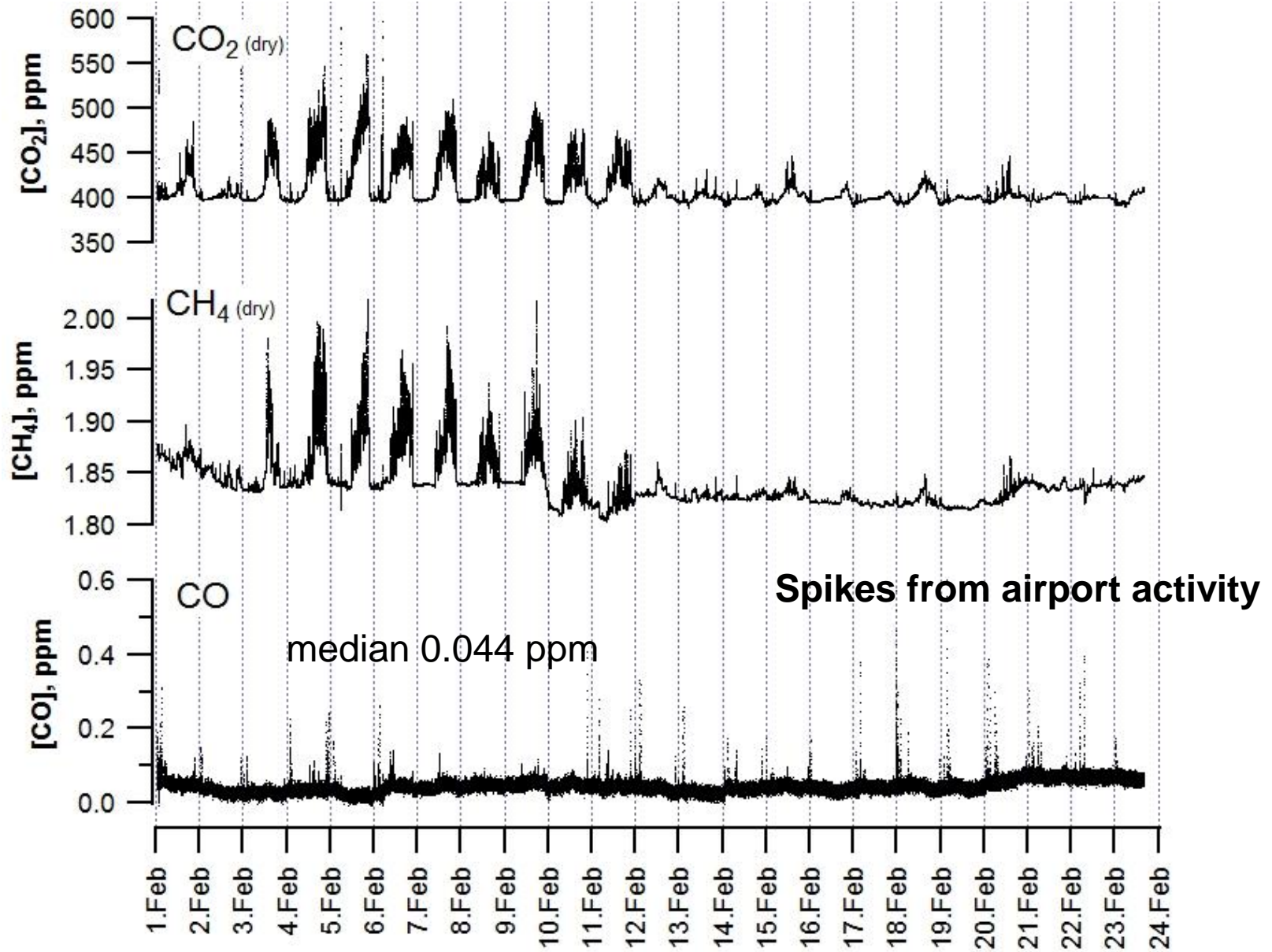
Feb 22



- Middle period locally quiescent with more dispersion around Manus
- Colours are on a log scale so blue area is most important

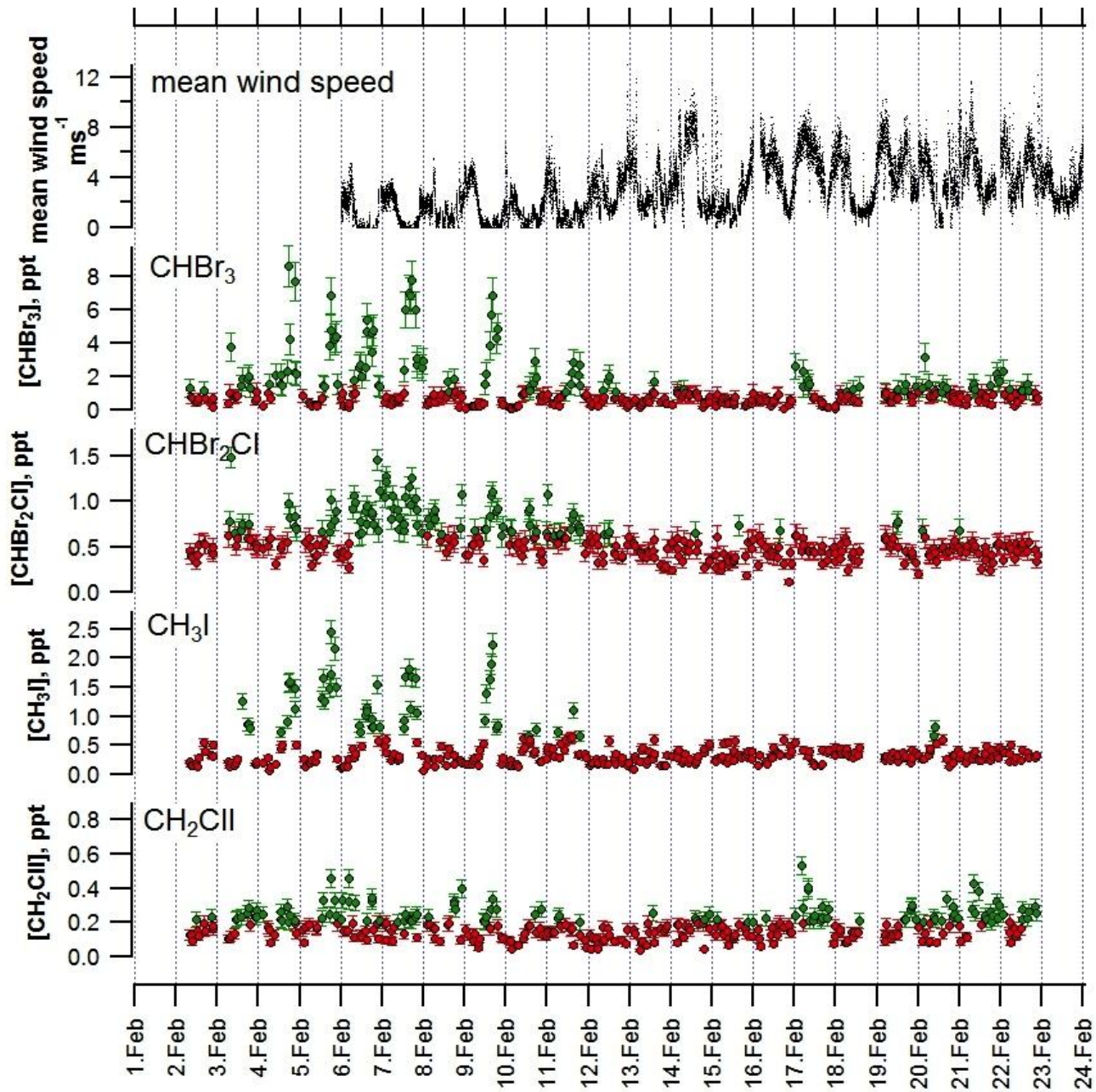
Picarro measurements on Manus Island

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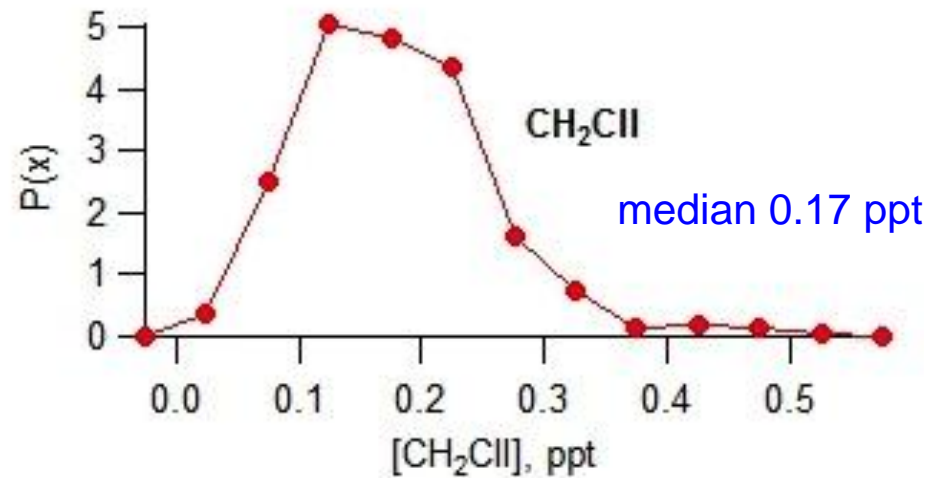
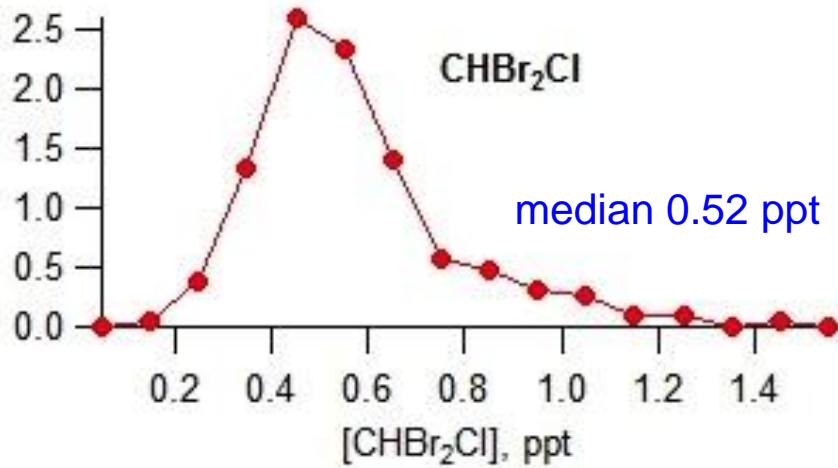
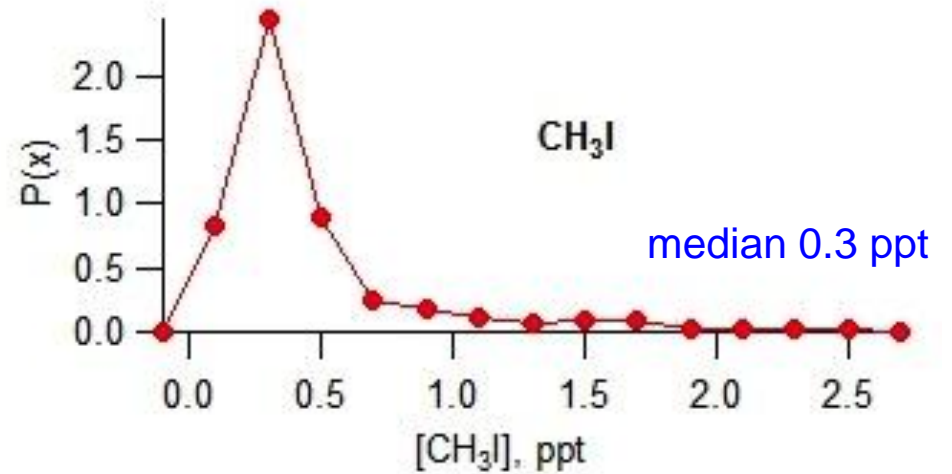
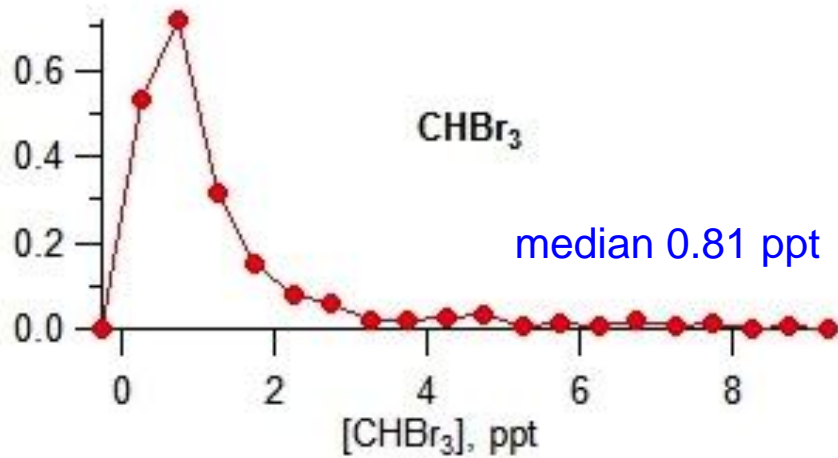


Dirac VLSL measurements on Manus Island

Times are all UT



Dirac VSLs measurements on Manus Island



Summary

- Calm nights, strong diurnal variability in 1st half of campaign
- Strong local influence, including evidence of local VSLs sources
- Change in met conditions from ~12-Feb, fewer calm nights
- Analysis on-going
- Data do not seem to be on BADC yet
 - will be sorted
 - ask directly in short term

Acknowledgements:

ARM

Papua New Guinea Weather Service (Hymson Waffi and staff)

LANL

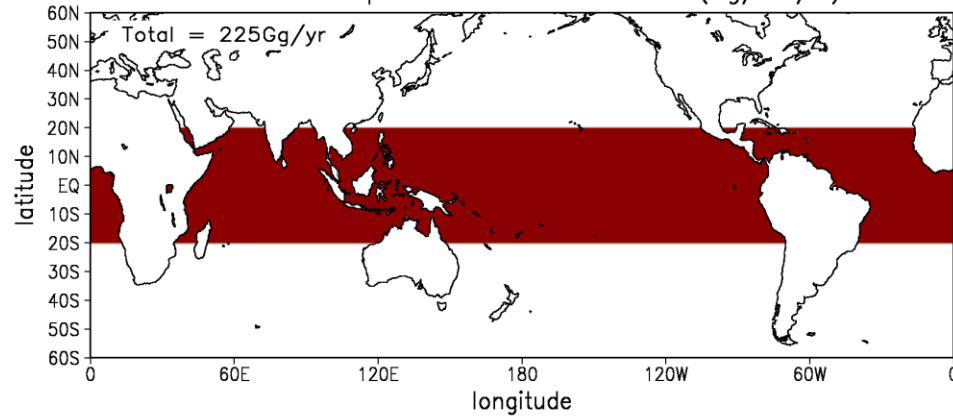
NERC

High resolution UKCA modelling

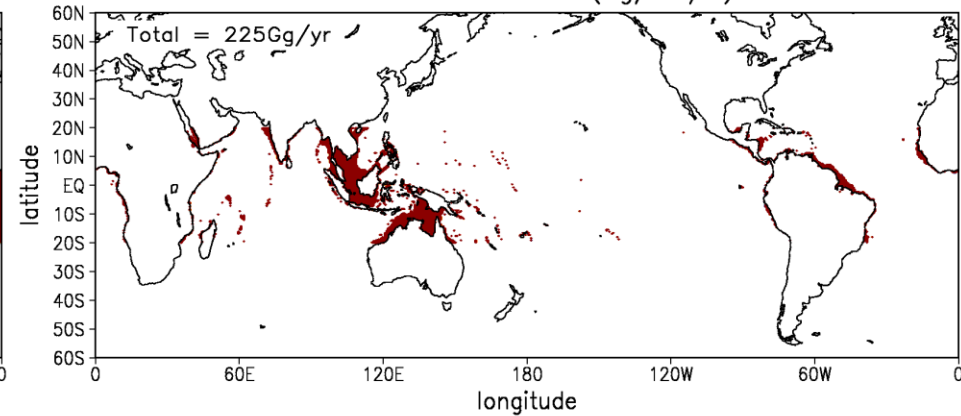
Maria Russo,
James Keeble

- UKCA at N320: 0.37° (lat) x 0.56° (long) with chemistry and idealised tracers
- run in process for Nov 2013 to Mar 2014 – *these results from 2005 as example*

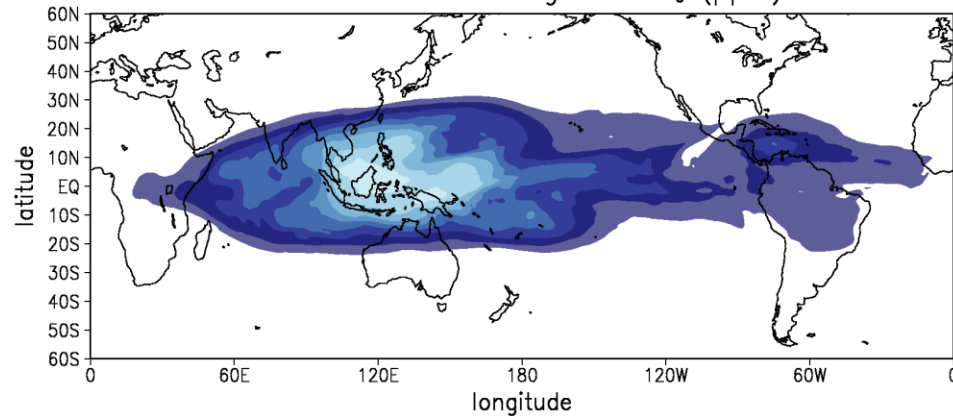
Uniform tropical ocean emissions ($\text{kg}/\text{m}^2/\text{s}$)



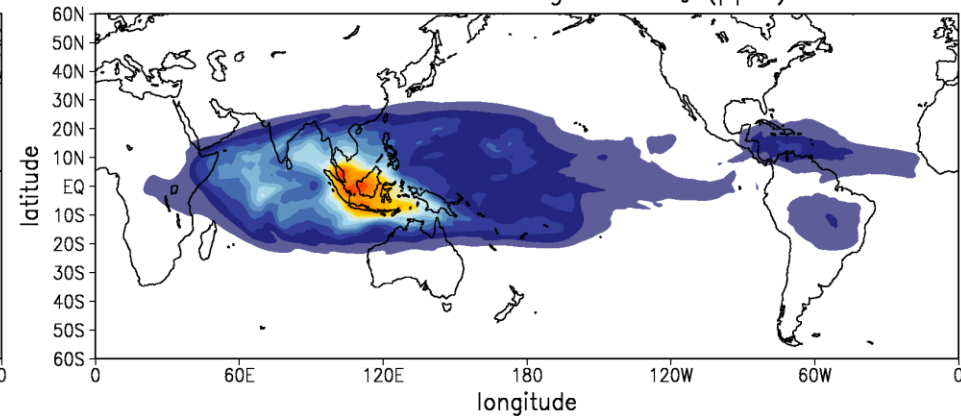
Coastal emissions ($\text{kg}/\text{m}^2/\text{s}$)



14.5–16.3km averaged CHBr_3 (pptv)

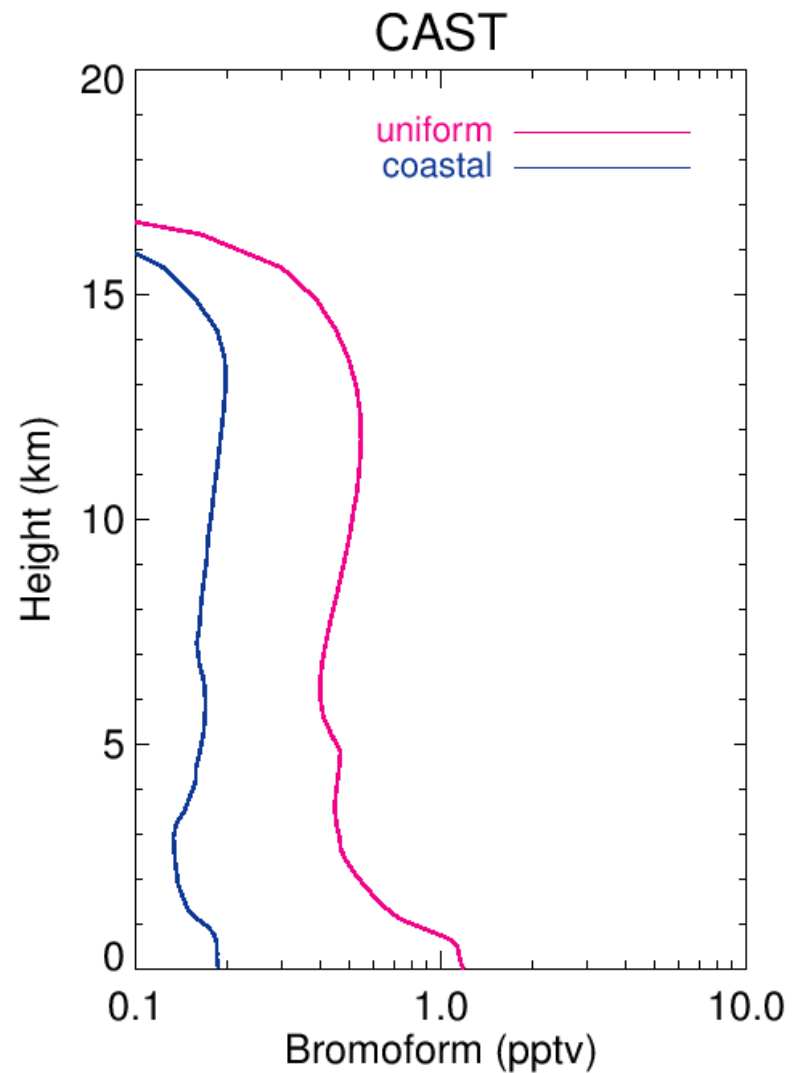
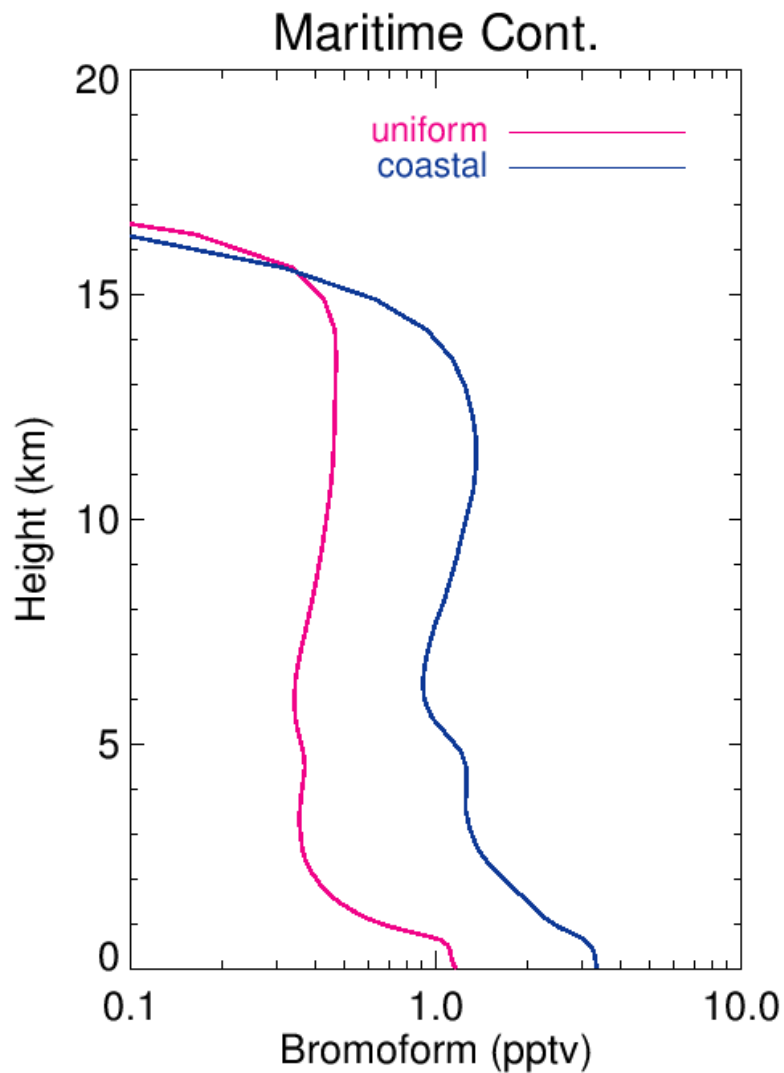


14.5–16.3km averaged CHBr_3 (pptv)



High resolution UKCA modelling

- UKCA at N320: 0.37° (lat) x 0.56° (long) with chemistry and idealised tracers
- ru



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