Boundary layer $CHBr_3$ and DMS so far

Alfonso Saiz-Lopez, Julie Nicely, Ross Salawitch, Doug Kinnison, Eric Apel, Rebecca Hornbrook, Daniel Riemer, Shawn Honomichl

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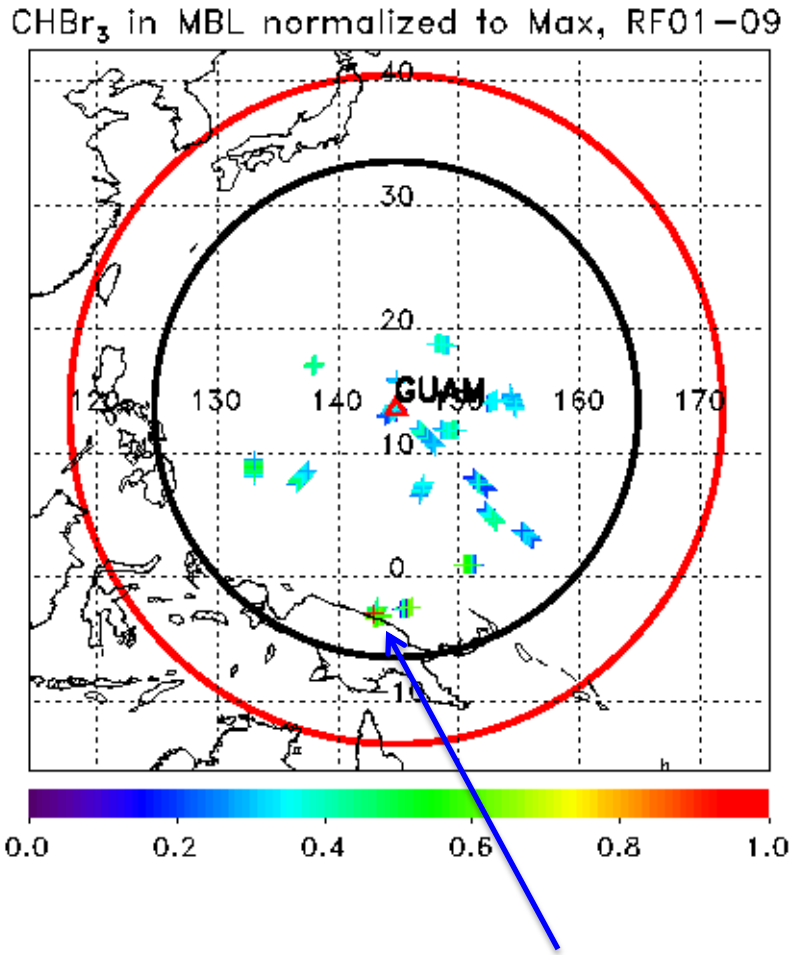
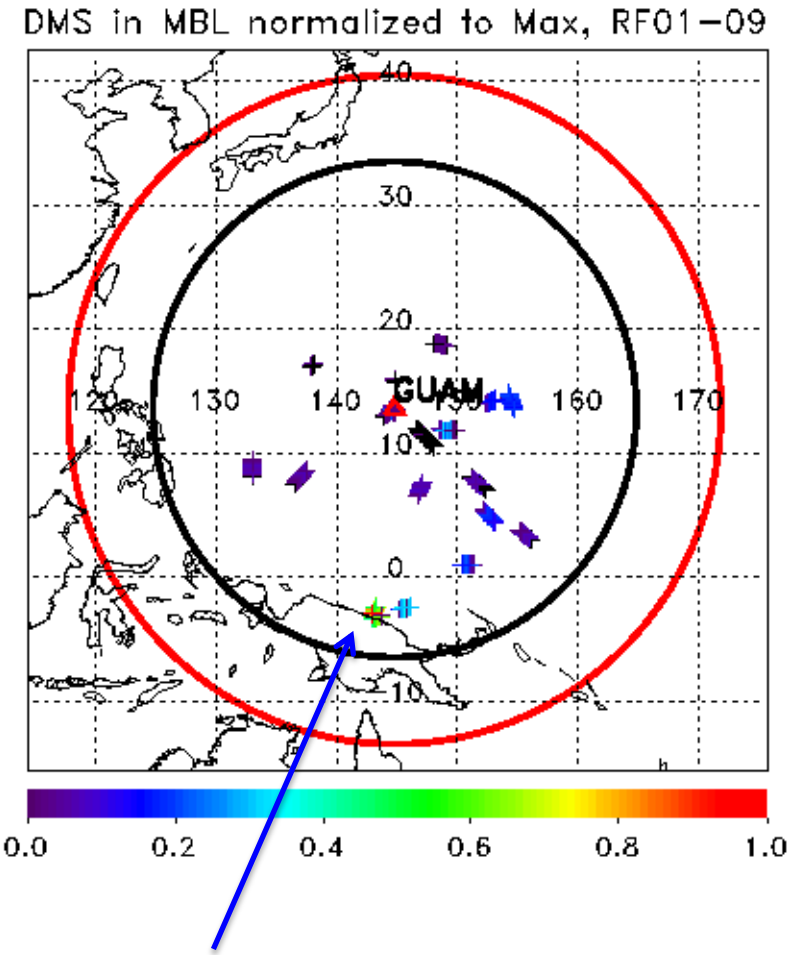


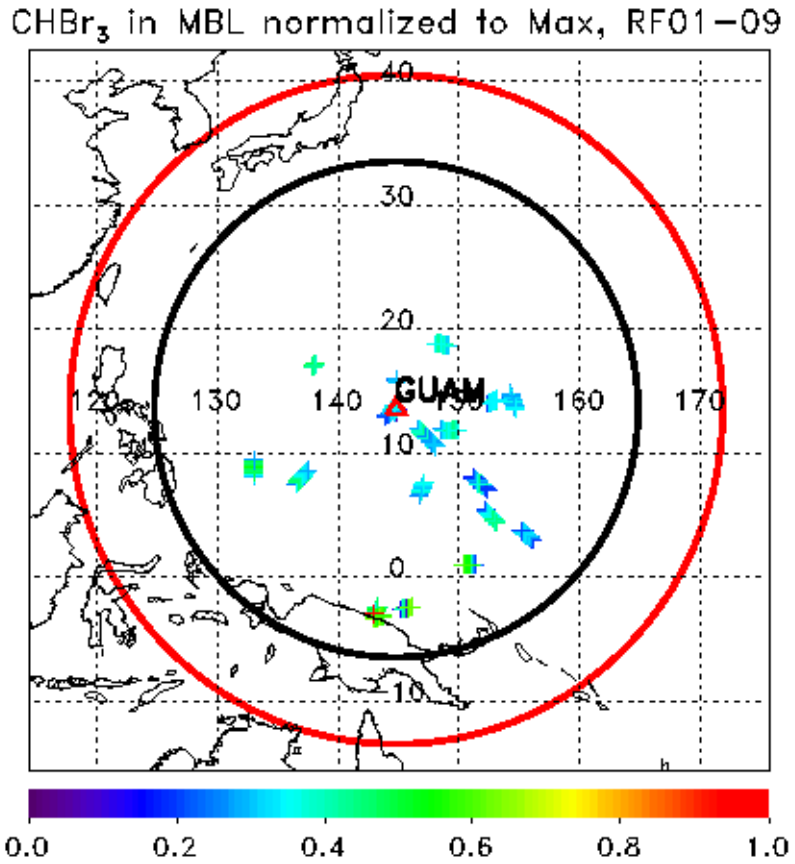


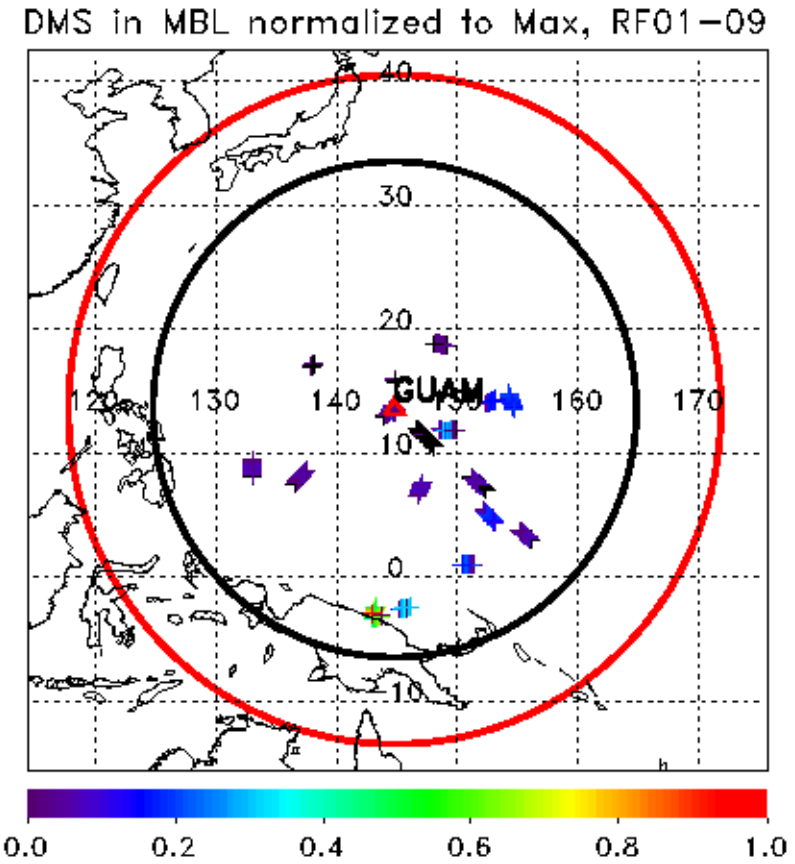
$CHBr_3$ max ~ 5.3 ppt

Larger levels at the coast perhaps towards the east

DMS max ~ 104 ppt (unprocessed RF09)

DMS very low except close to the coast of PNG





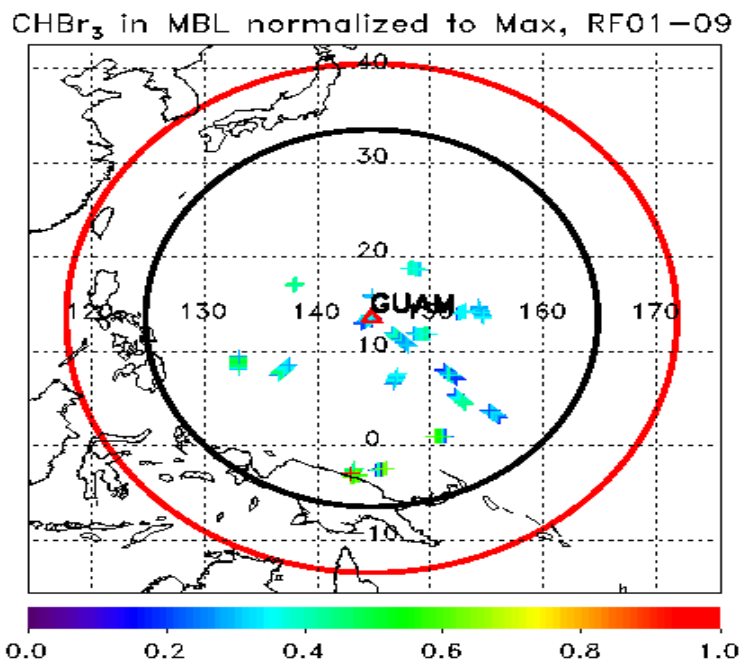
Low levels of DMS observed at mid- to upper-trop

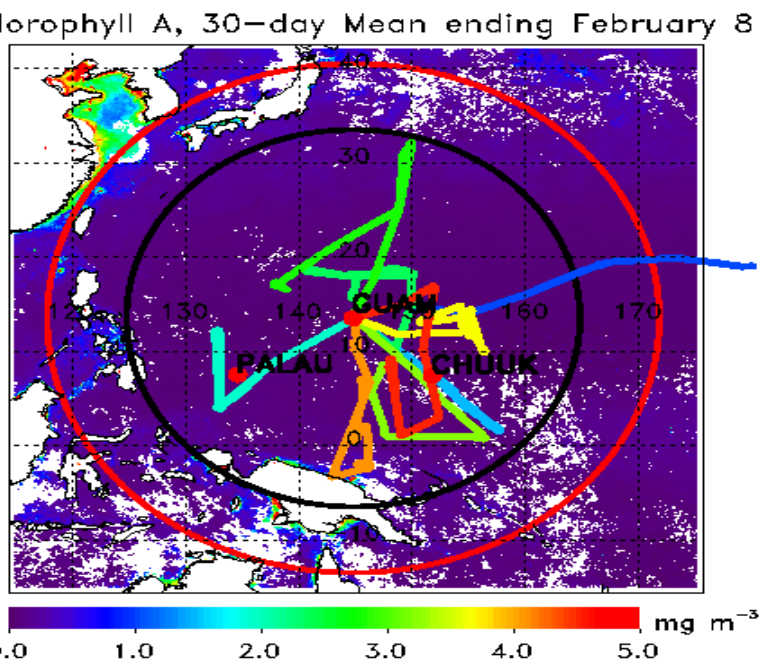
DMS lifetime:

Rate BrO + DMS $1.4 \times 10^{-14}\ e^{(950/T)}$; [BrO] 1-2 ppt

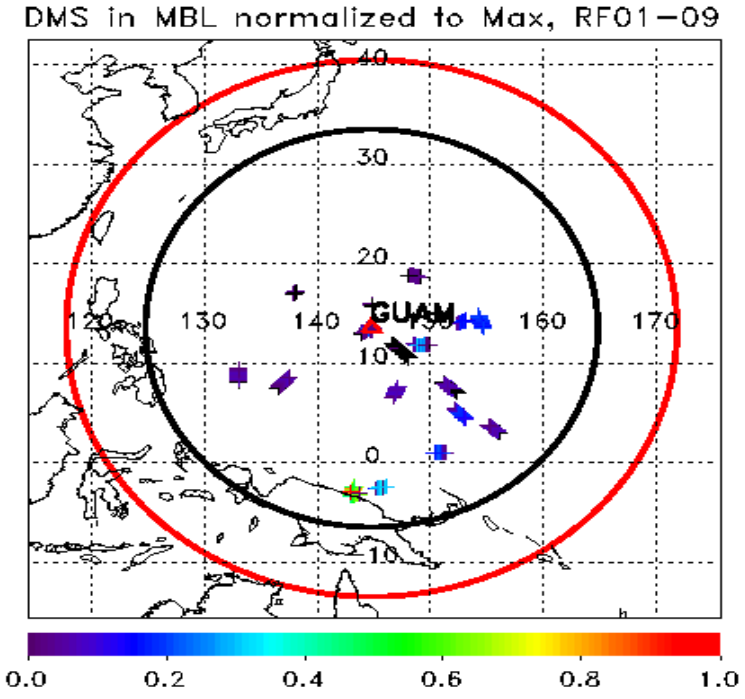
Rate OH + DMS $1.2 \times 10^{-11}\ e^{(400/T)}$; [OH] 0.02 ppt

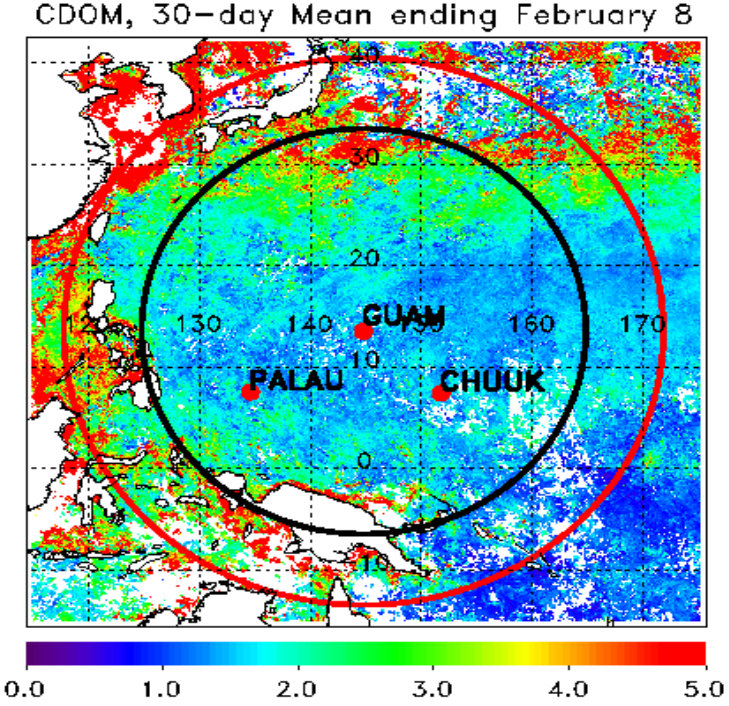
→ ~ 19 hours


CHBr3 in MBL normalized to Max, RF01–09
40
30
20
10
0
120
130
140
150
160
170
GUAM
0.0
0.2
0.4
0.6
0.8
1.0


Chlorophyll A, 30–day Mean ending February 8
40
30
20
10
0
120
130
140
150
160
170
GUAM
PALAU
CHUUK
0.0
1.0
2.0
3.0
4.0
5.0
mg m⁻³

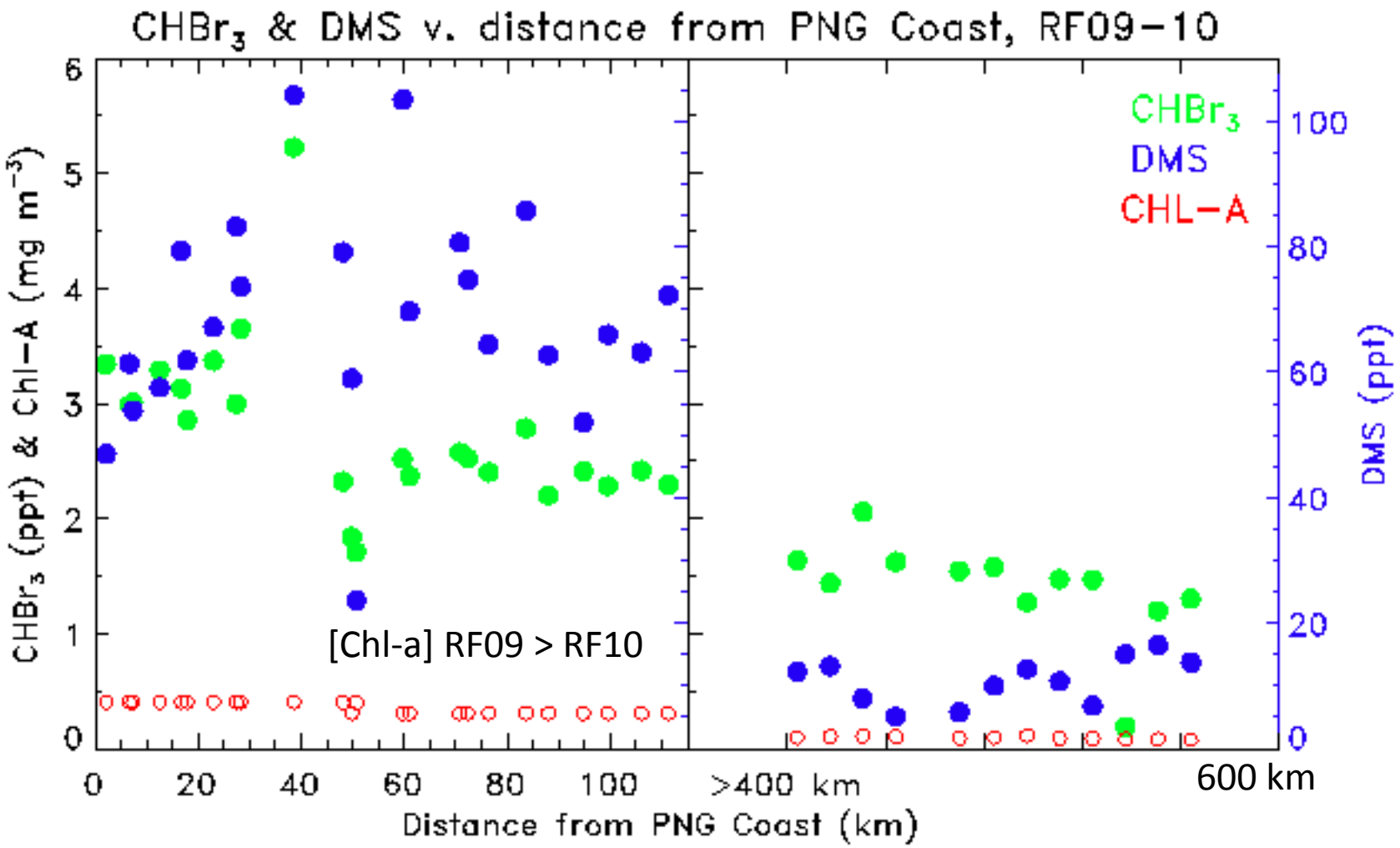
Chl-a


DMS in MBL normalized to Max, RF01–09
40
30
20
10
0
120
130
140
150
160
170
GUAM
0.0
0.2
0.4
0.6
0.8
1.0


CDOM, 30–day Mean ending February 8
40
30
20
10
0
120
130
140
150
160
170
GUAM
PALAU
CHUUK
0.0
1.0
2.0
3.0
4.0
5.0

CDOM

A case study: Coastal *vs* open ocean



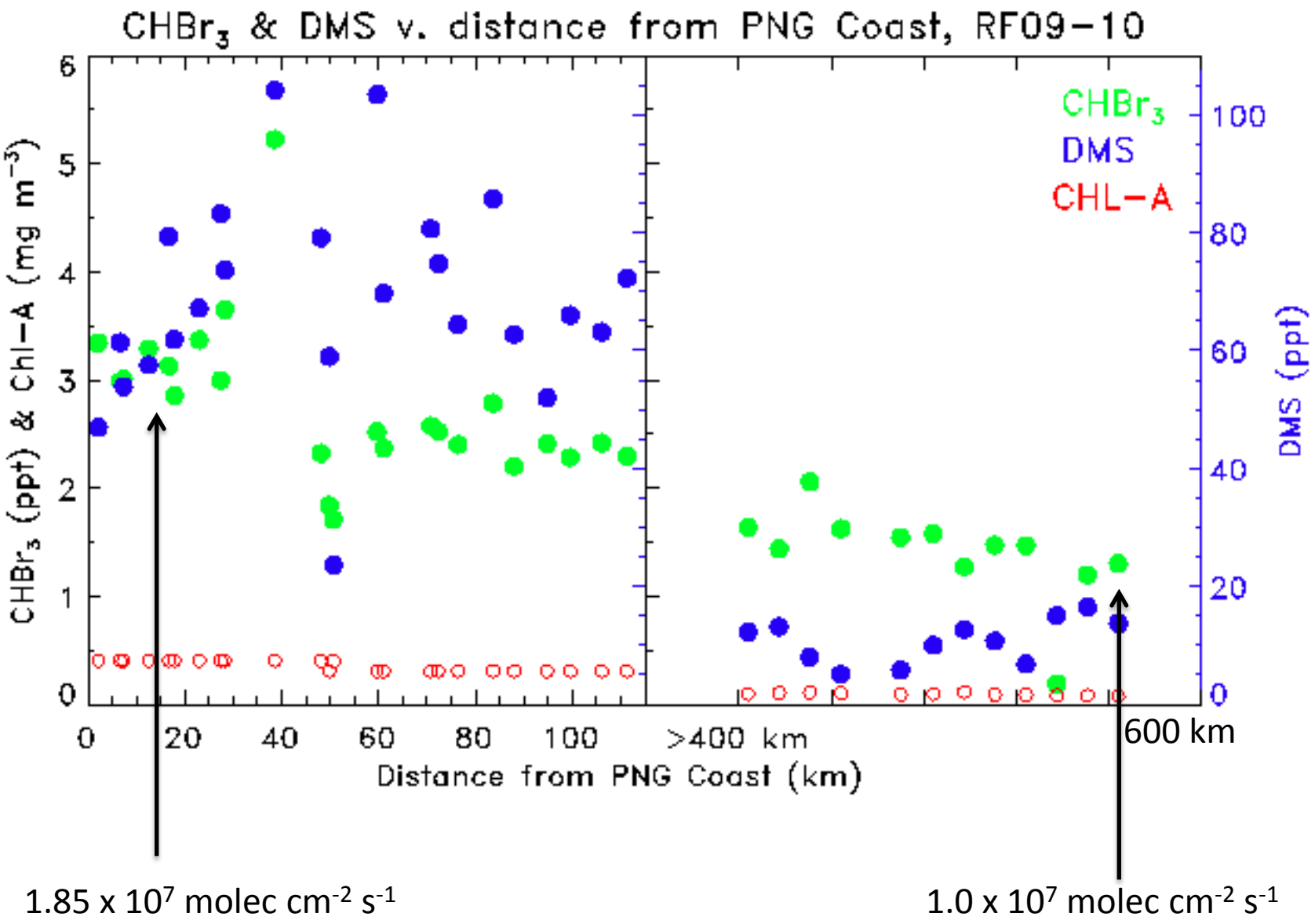
RF09

T inversion at about 600 m, T 30 C
Descend/ascend MBL
ws 3-6 m s^{-1} ; SST 29 C

RF10

T inversion at about 500-600 m, T 30 C
Descend/ascend MBL
ws 3-6 m s^{-1} ;SST 28-29 C

A case study: Coastal *vs* open ocean



Summary

- Levels of MBL DMS low except close to coast for RF09.

- Levels of MBL $CHBr_3$ higher over the coast of PNG
  although with less of gradient than DMS.

- Certain degree of correlation between DMS/$CHBr_3$ and Chl-a/CDOM

- Possibility of interesting cases studies coastal *vs* open ocean

Considerations:

Characterize drivers of oceanic emissions of target gases to possibly help plan remaining flights.

Wind speed and **concentration gradients** are direct factors that influence sea-to-air fluxes. Some more indirect factors that could possibly impact the emissions include SST and MBL height through their intensifying or decreasing effect on the concentration gradient.

The **MBL height** has implications for both atmospheric mixing ratios of halocarbons and sea-to-air fluxes via the concentration or dilution of atmospheric gases within a decreasing or increasing MBL height.

Water temperature affects the transfer of dissolved gases through the surface liquid film by its influence on the diffusivity of gas in water and by changes of the viscosity of water. Water viscosity as well as wind stress determine the thickness of the liquid surface layer.