Update to IRWG-wide OCS analysis

J Hannigan & Ivan Ortega

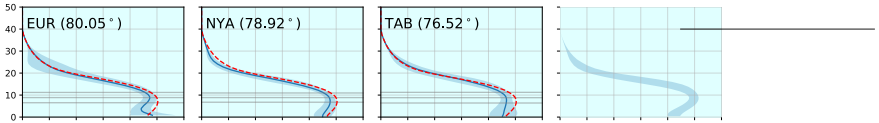
E Mahieu, N Jones, S Conway, M, Palm – preliminary testing

F Hase, M Rettinger – Conversion to PROFFIT

M Makarova – Recent sensitivity testing

& All IRWG

Retrievals



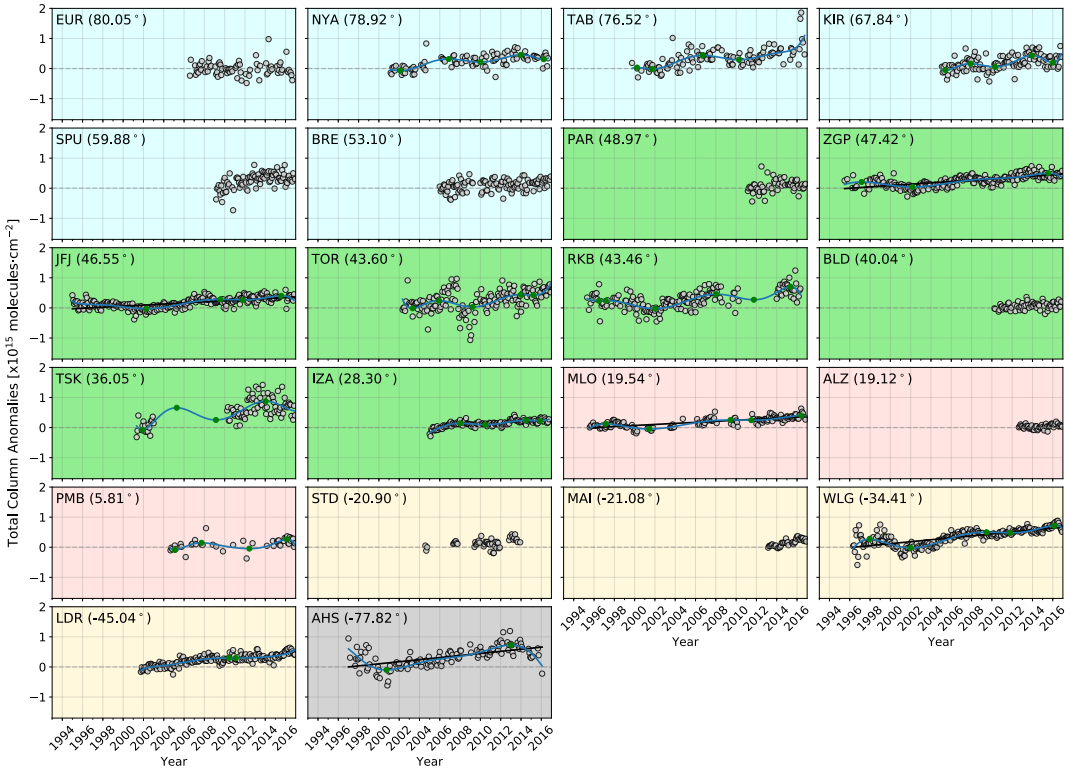
Total Column

Bin to monthly values
Remove annual cycle
Fit anomalies w/ 7th order polynomial

Changes in trend determined from longest time series.

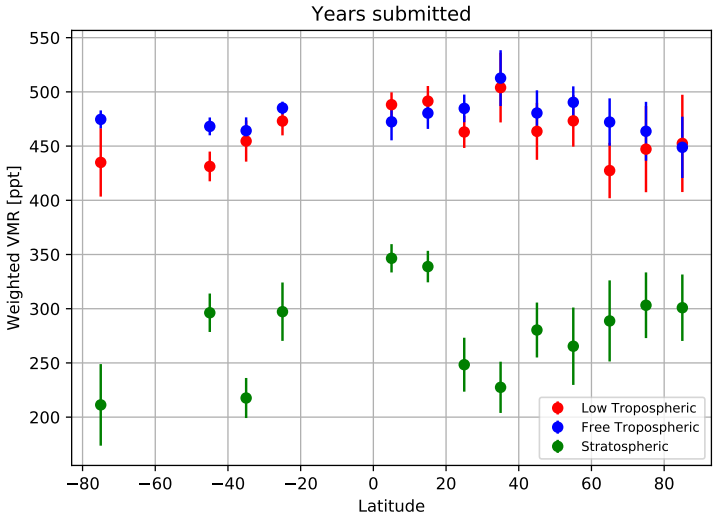
NYA – early data?

St Denis & Maido combined to one series

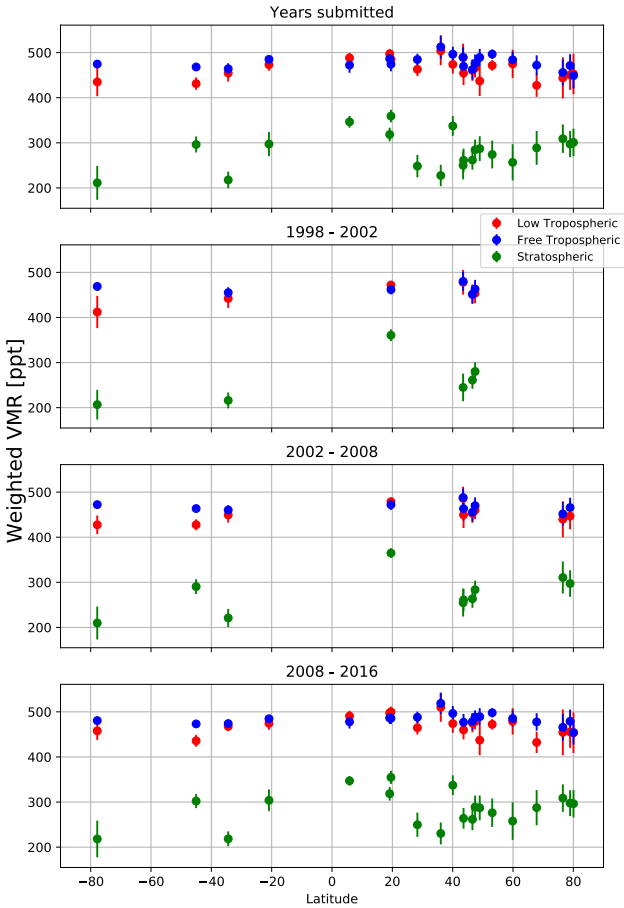


Mean VMR

- Note reversal free trop / low trop at tropics/sub tropics
  - Extensive source of oceanic OCS?
- Decrease in N mid-latitudes
  - Attributed to vegetation drawdown by Montzka et al 2007
- Lowest strat vmr in SH WLG & AHT but less so LDR
  - Older air?



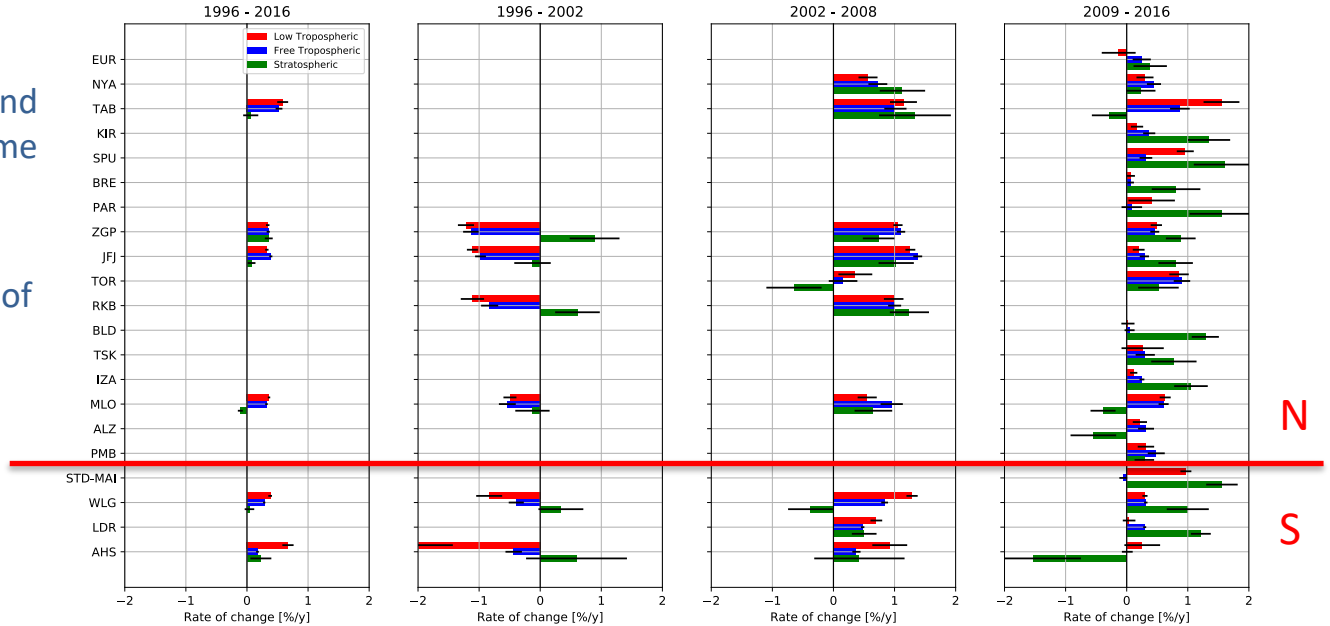
Bin to 10º
Latitude bins



All Sites / Trend periods

Summary trends

- TAB – Positive Trop. recent trend influenced by high 2016 springtime observations.
- AHT – Negative Strat. recent trends influenced by last 2 years of low values



All data

Recent trend

Stratospheric Lifetime

Determined by ratio with N2O & N2O lifetime

T_{n2o} = 117 ± 20 y

Wide latitude coverage with this dataset…

High N. latitudes (85y) found to be longer then most previous values but within uncertainties (barely).

Mid latitudes tend to be low

SH esp. AHT fairly long

Table 5. Calculations of the stratospheric lifetimes of OCS using EQ 3 and measured FT OCS and N_2O concentrations across the five latitude bands.

Latitude Band [° N]	*A* [ppb/ppb]	Mean FT OCS [ppb]	Mean FT N_2O [ppb]	R^2	Average Lifetime [year]
50. : 90.	482.9 ± 6.8	0.472 ± 0.028	315.8 ± 10.8	0.79	84.5 ± 15.6
20. : 50.	327.3 ± 4.6	0.483 ± 0.020	318.4 ± 5.3	0.86	58.0 ± 10.3
-20. : 20.	309.3 ± 13.4	0.477 ± 0.016	319.4 ± 4.5	0.83	54.1 ± 9.7
-50. : -20.	448.1 ± 10.2	0.468 ± 0.012	314.3 ± 6.7	0.90	78.1 ± 13.7
-90. : -50.	577.6 ± 20.9	0.475 ± 0.008	310.2 ± 6.2	0.89	103.4 ± 18.3

$$\frac{\tau_{OCS}}{\tau_{N_2O}} = A \cdot \frac{wVMR_{OCS}}{wVMR_{N_2O}}$$

Summary

- NYA & EUR data questions remain
- Should we add more years (!)
- Draft was distributed last week.
  - Please review,
  - Add co-authors
- Comments welcome
- Submit soon

end