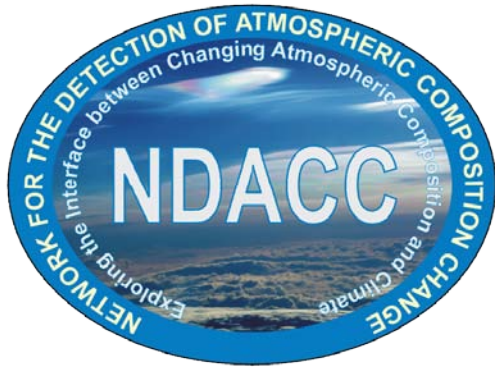
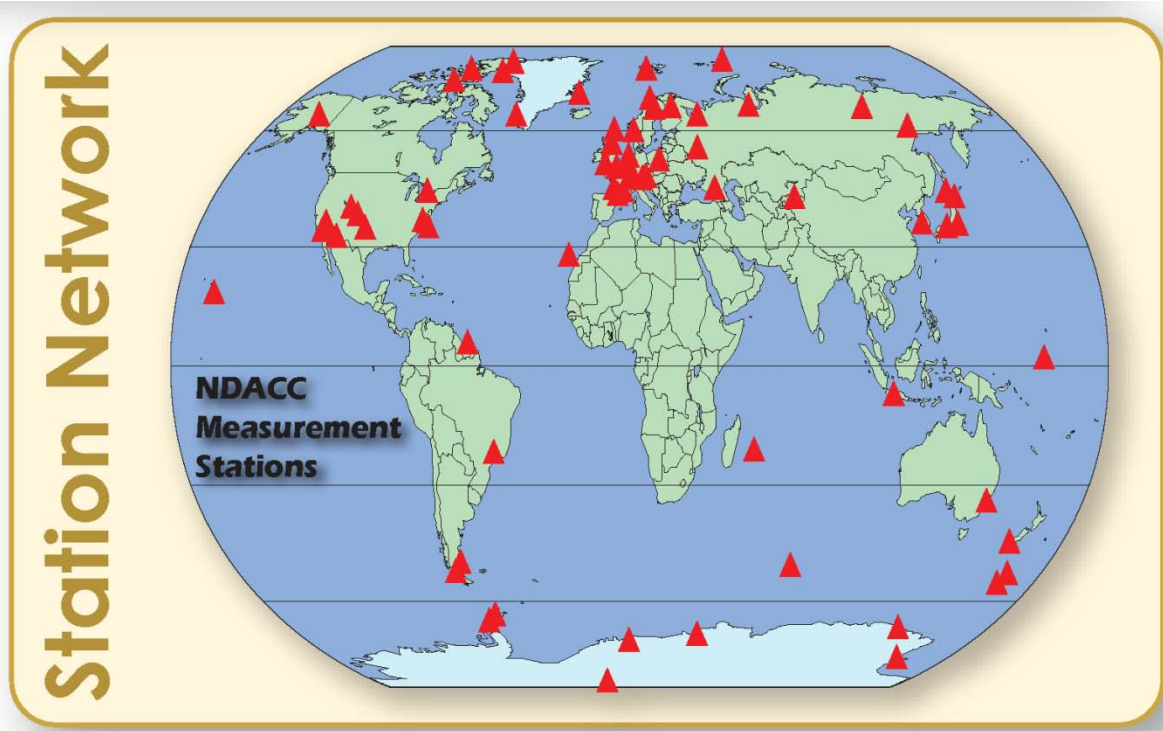


# OCS measurements in NDACC-IRWG

Yuting Wang & NDACC contributors



The Network for the Detection of Atmospheric Composition Change



## Working Groups and Theme Groups

Dobson & Brewer

FTIR

LIDAR

Microwave

Sondes

Spectral UV

UV-Visible

Satellite

Theory & Analysis

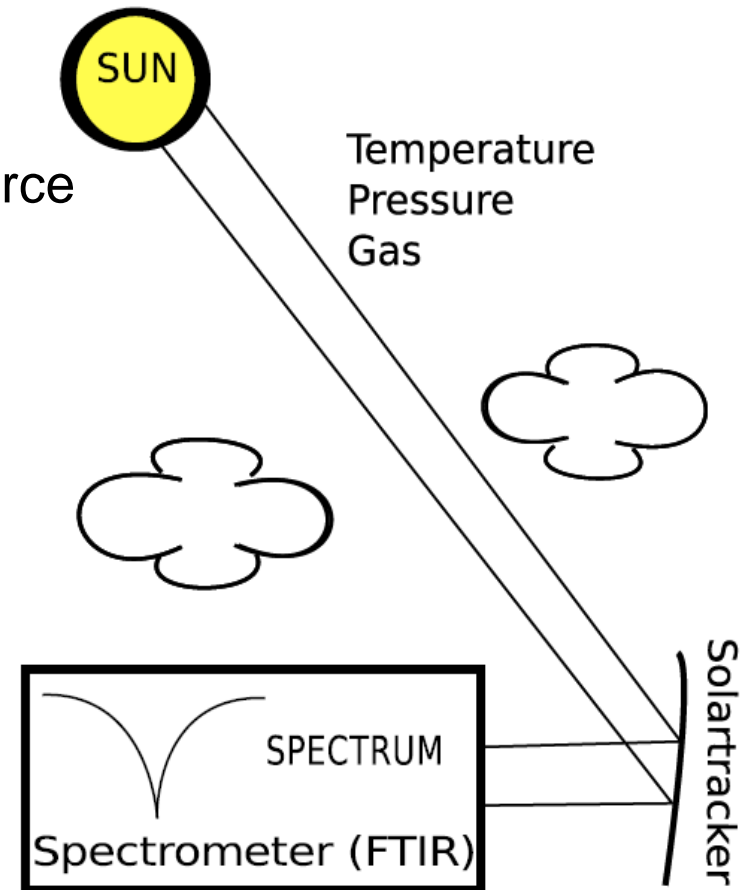
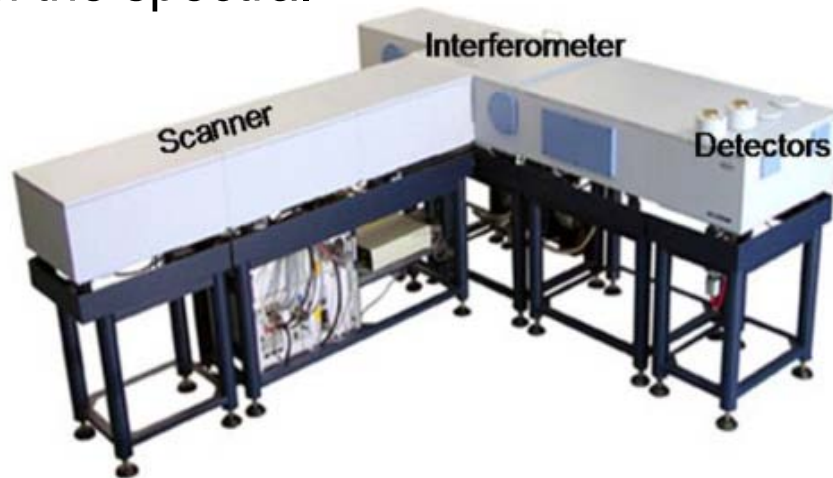
Water Vapour

Ozone

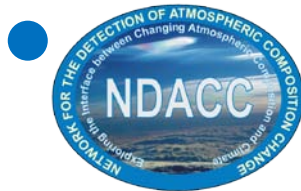
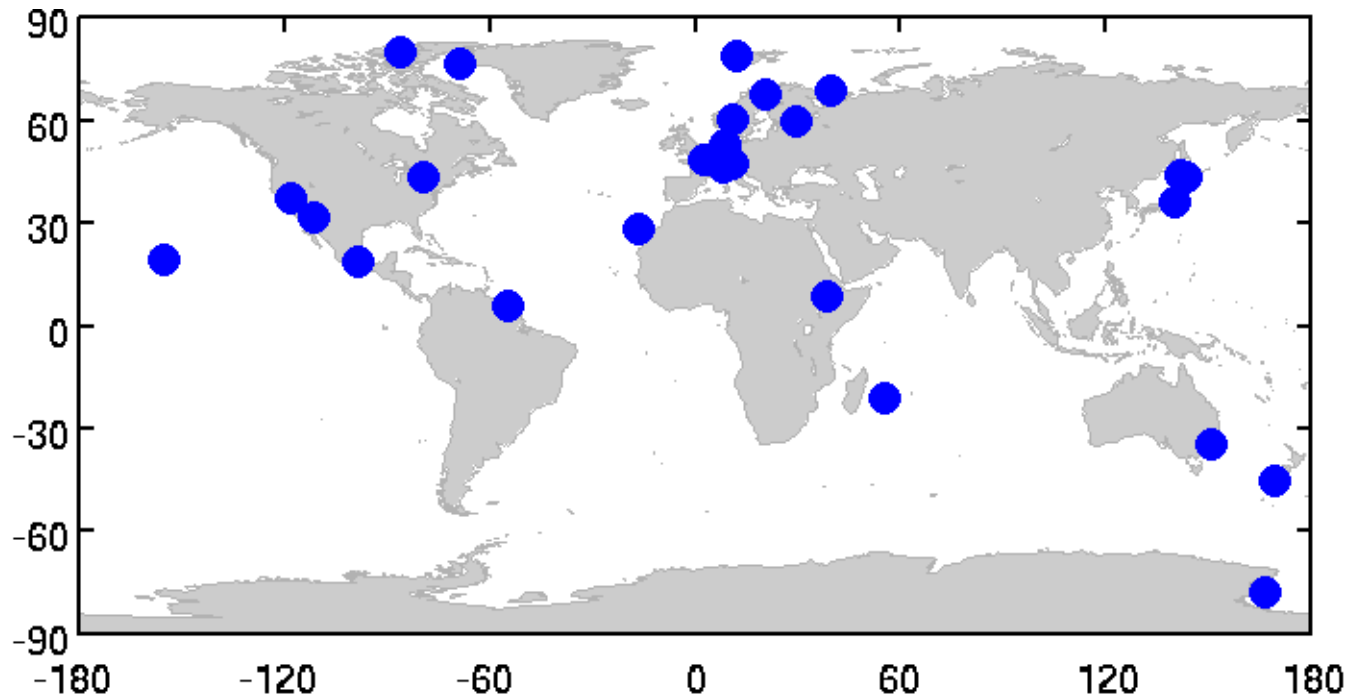
Measurement Strategies & Emphases

# FTIR measurements

- Ground-based solar absorption FTIR spectrometry uses the sun as the light source
- It measures the spectra containing the absorption lines of trace gases.
- Gas columns or profiles can be retrieved from the spectra.

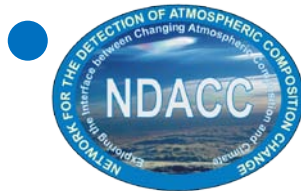
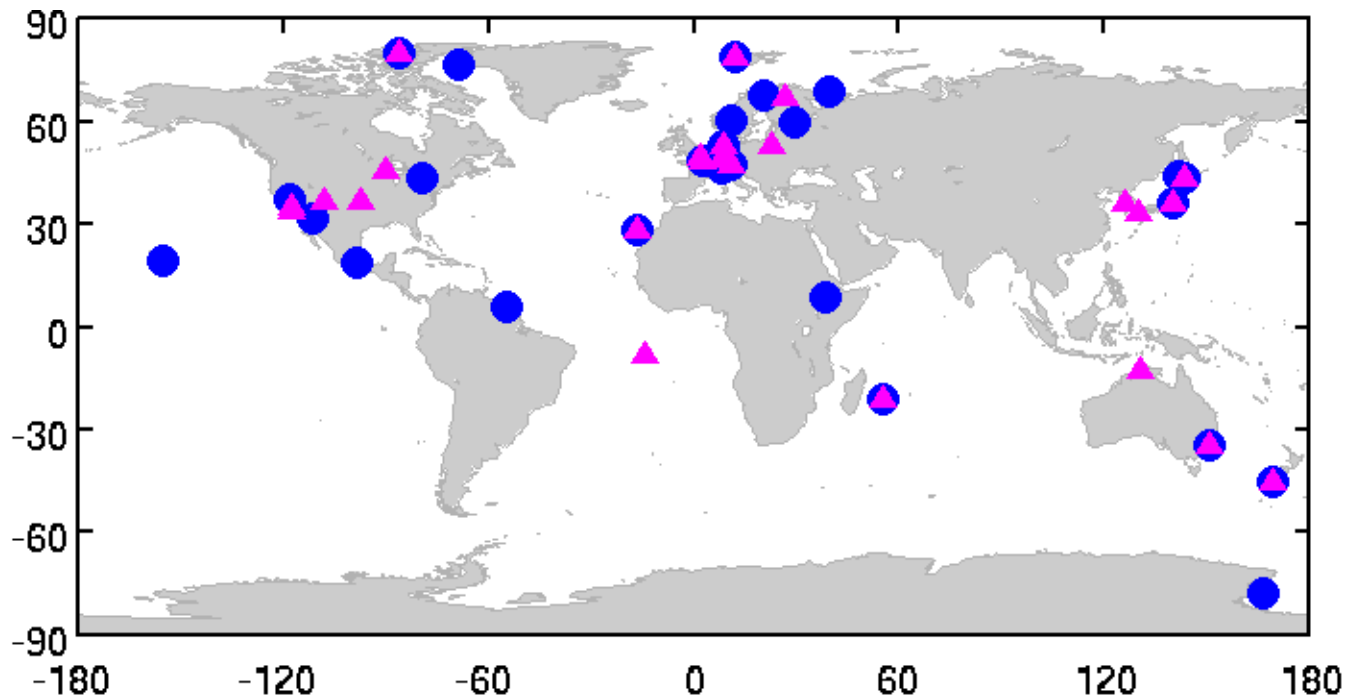


# FTIR Networks



● Mid-IR region  
OCS  
columns/profiles  
Date back to  
1980s

# FTIR Networks



● Mid-IR region  
OCS  
columns/profiles  
Date back to  
1980s

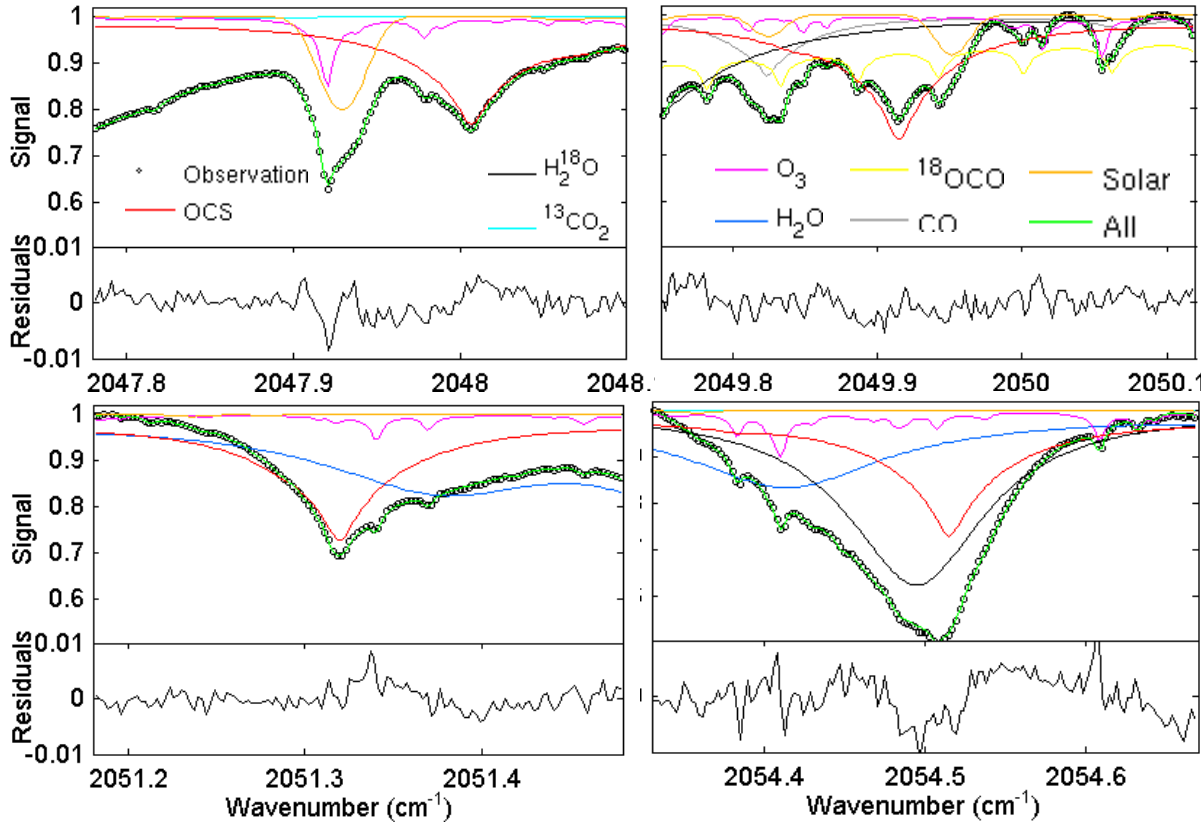


▲ Near-IR region  
CO<sub>2</sub> columns

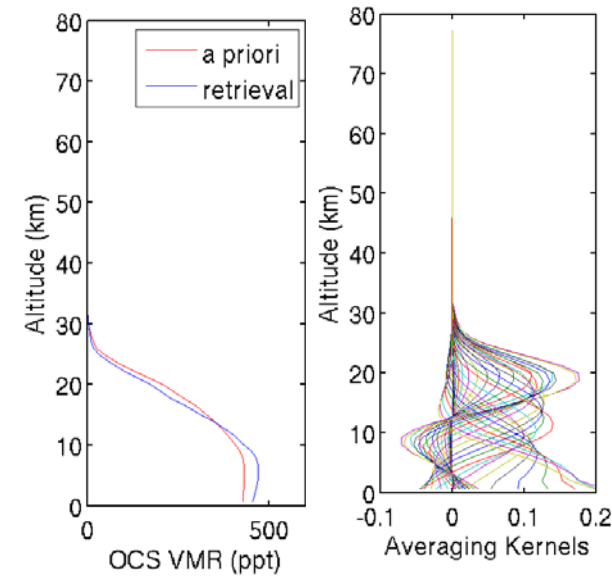
# OCS Retrieval

SFIT4 profile retrieval based on Optimal Estimation

## Retrieval micro-windows



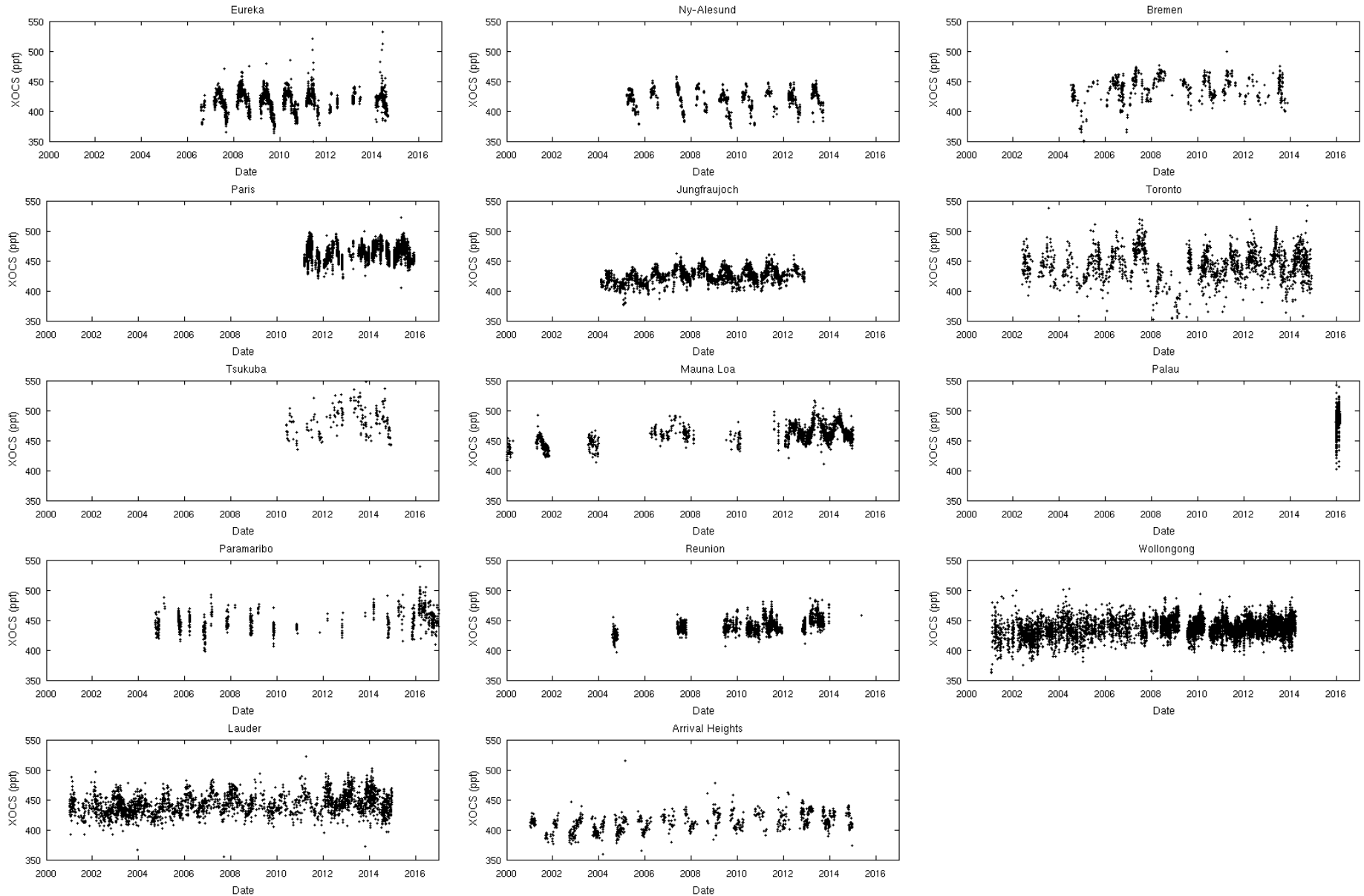
## An example of retrieved profile, and the averaging kernels



$$x_{\text{OCS}} = \text{OCS} / \text{Air mass}$$

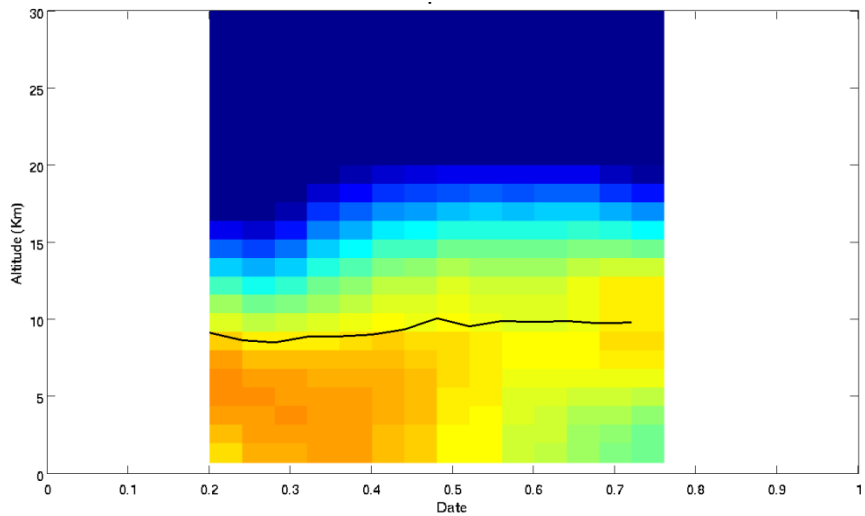
$$\text{Air mass} = Ph / RT$$

# Retrieved time series xOCS at selected sites

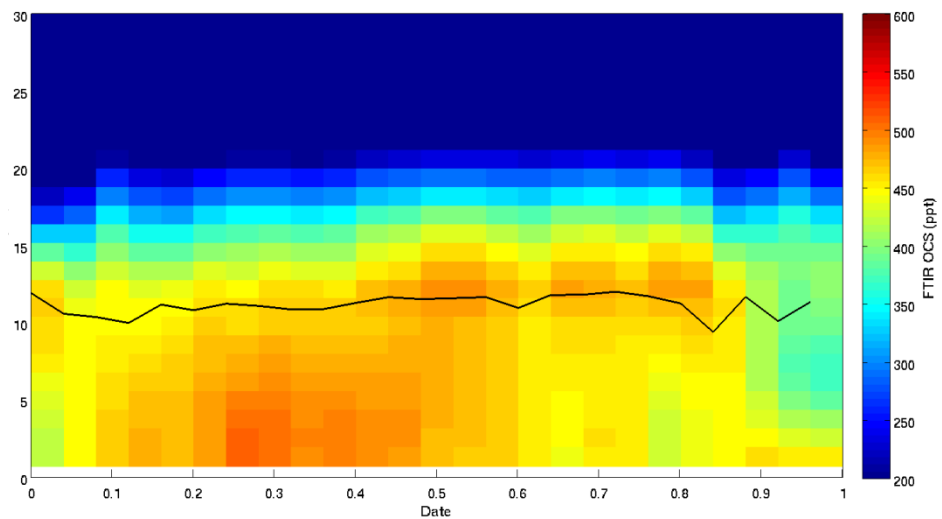


# Retrieved vertical profiles

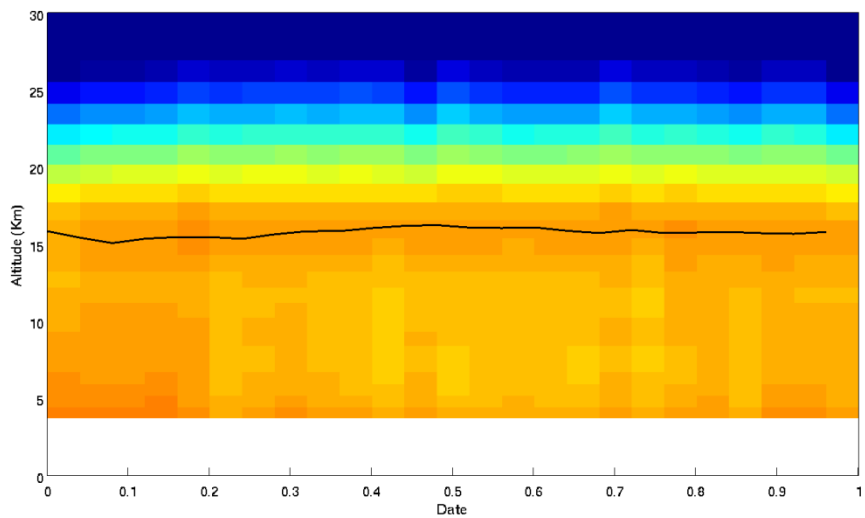
## Ny-Ålesund



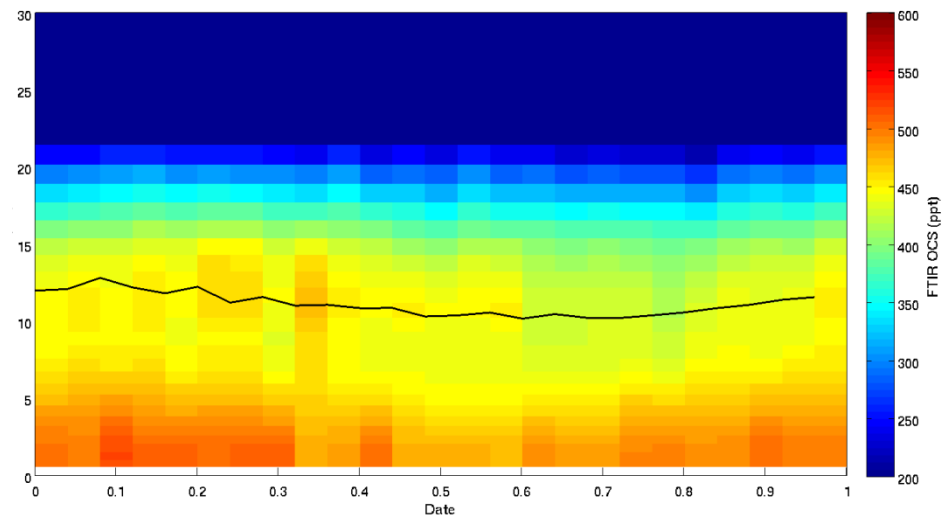
## Bremen



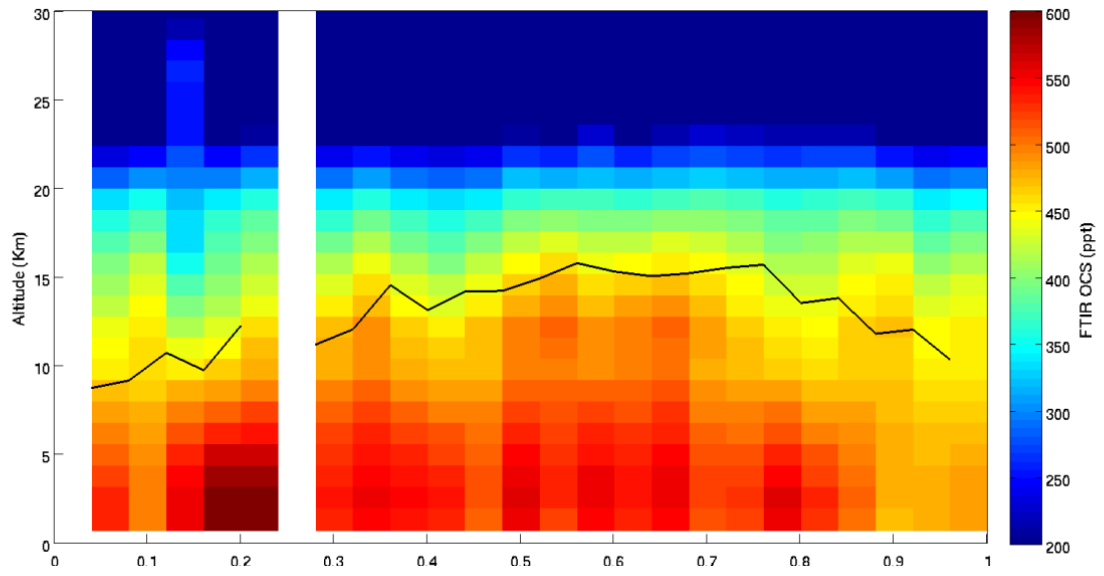
## Mauna Loa



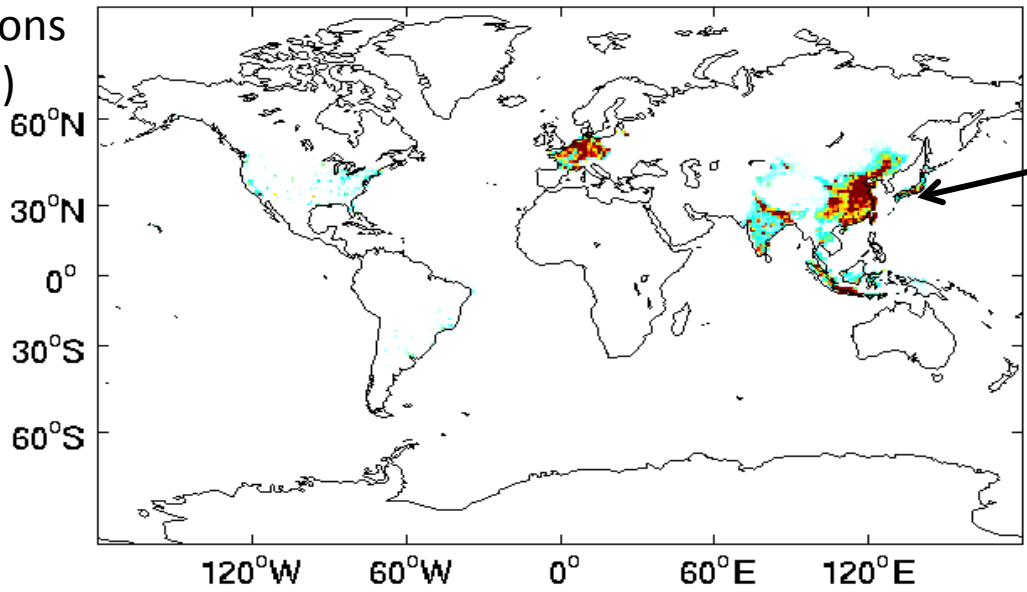
## Lauder



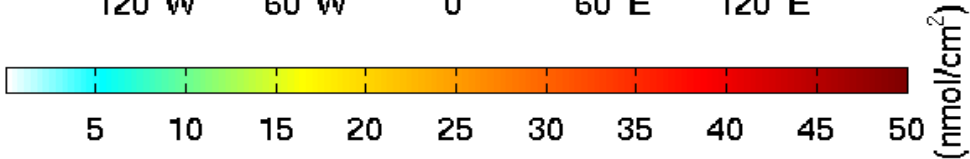
# Tsukuba



Anthropogenic emissions  
(Campbell et al., 2015)

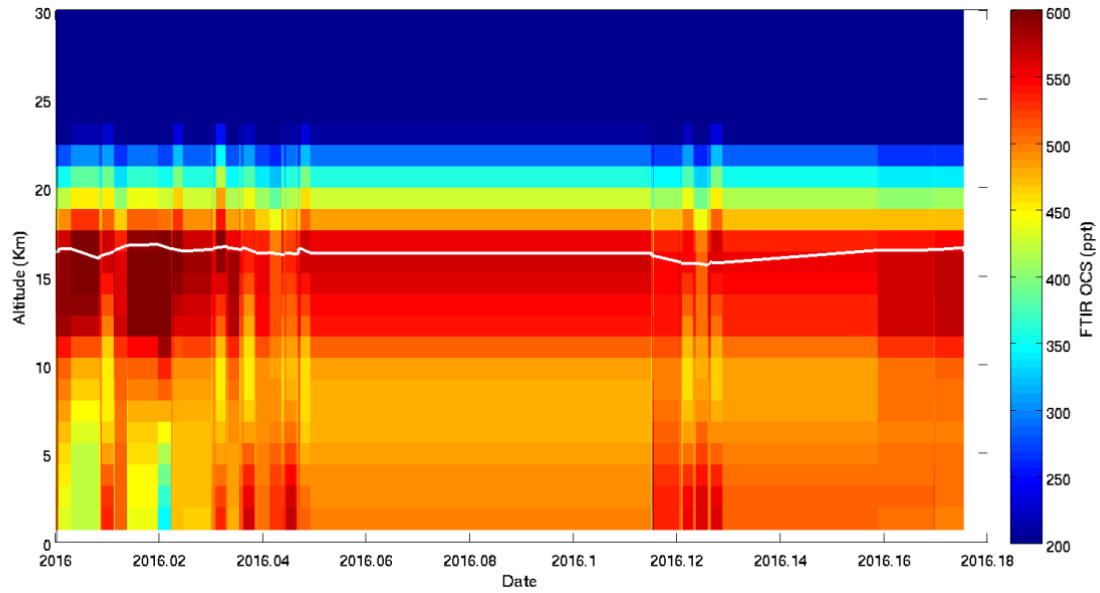


Tsukuba

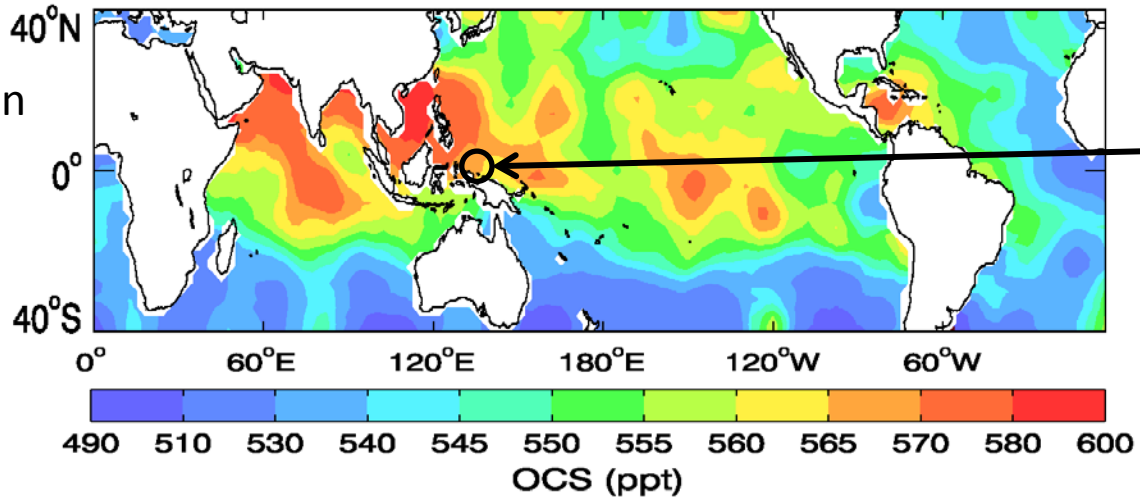




# Palau

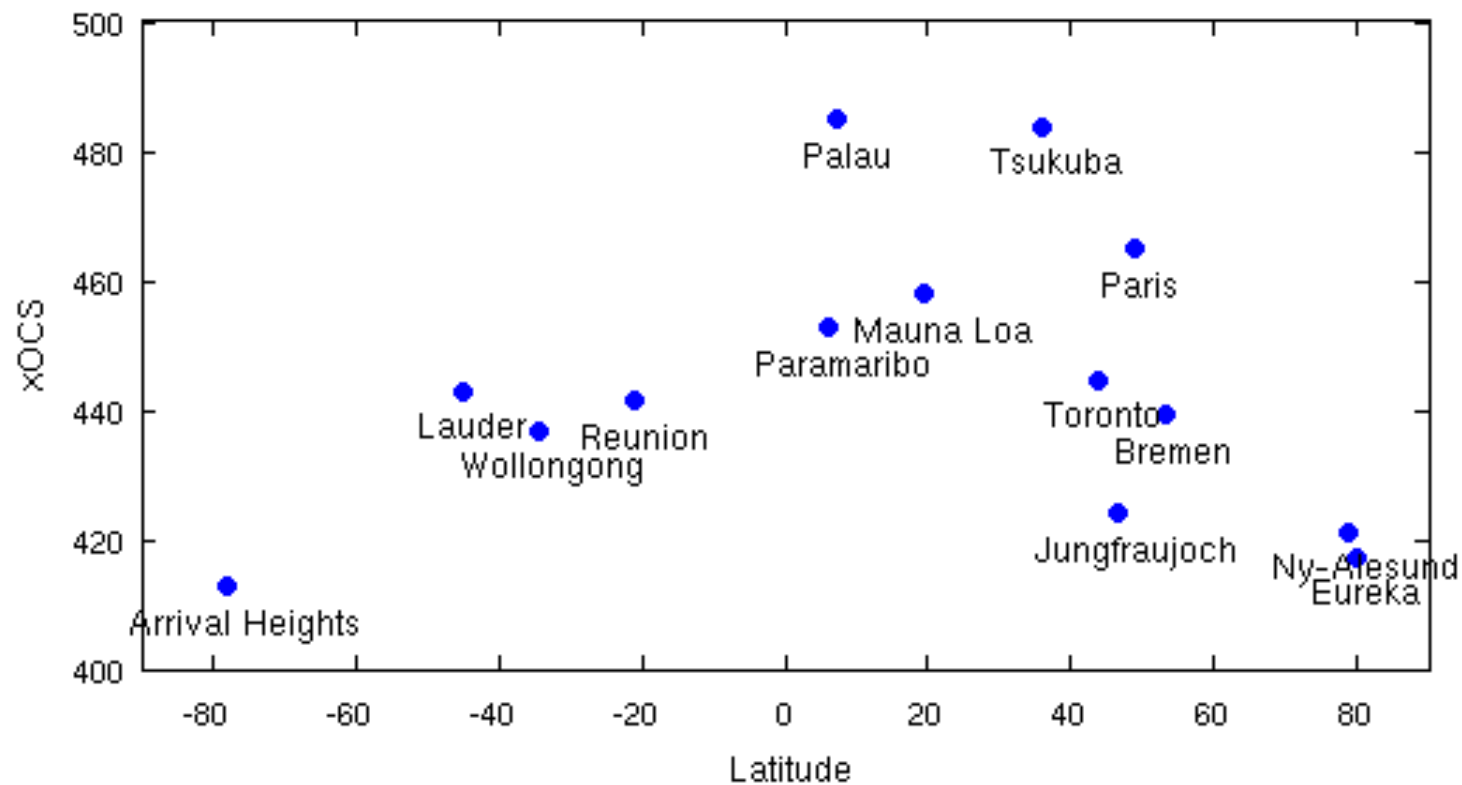


TES OCS observation  
(Kuai et al., 2015)



Palau

## Mean xOCS against latitude



# Potential usage of NDACC OCS database

- Fill measurement gap
- Validate OCS satellite measurements.
- Provide co-located, near-simultaneously measured OCS & CO<sub>2</sub> in combination of TCCON

