

Vertical distribution of aerosols in AeroCom ExpA

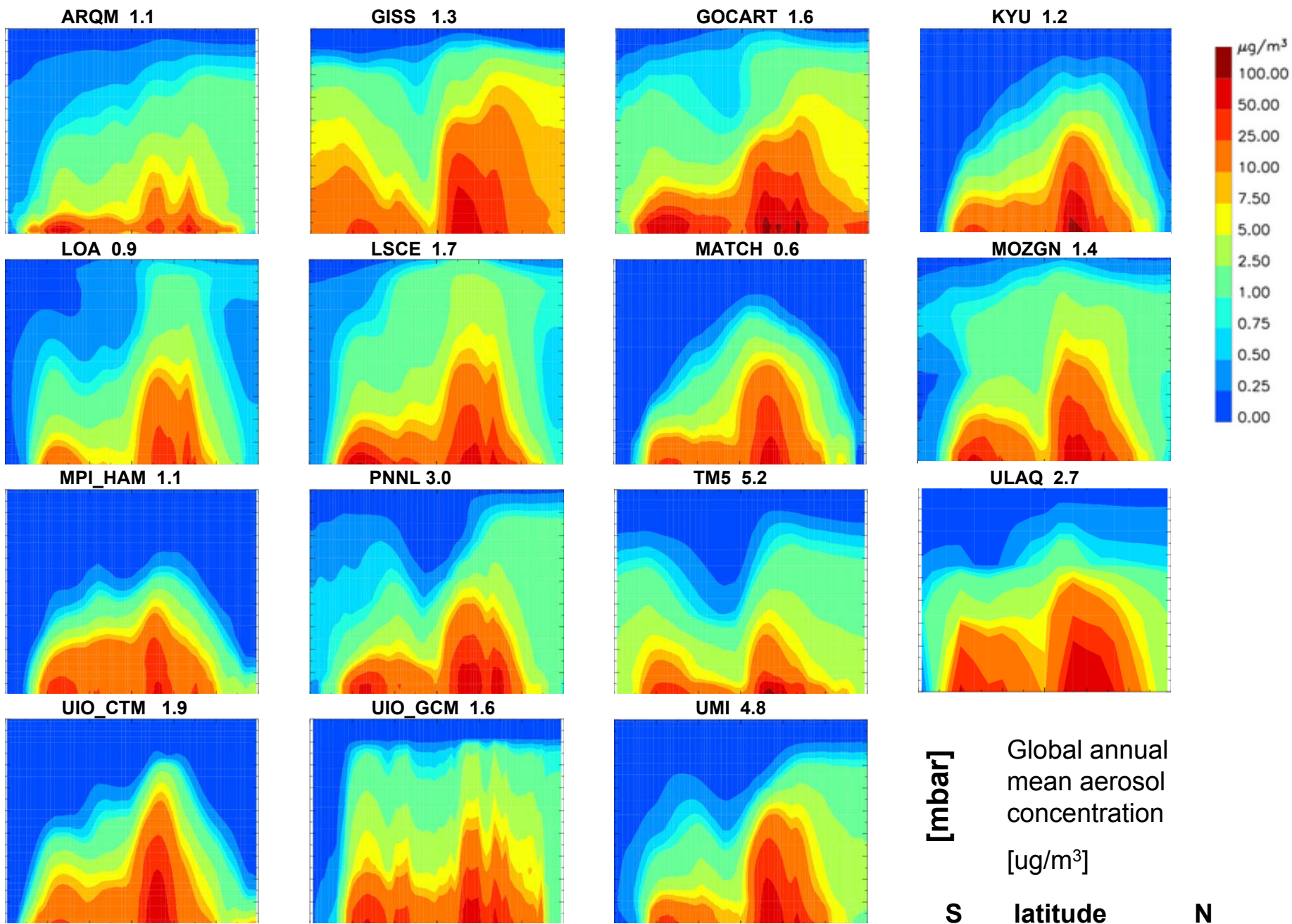
Christiane Textor

Michael Schulz

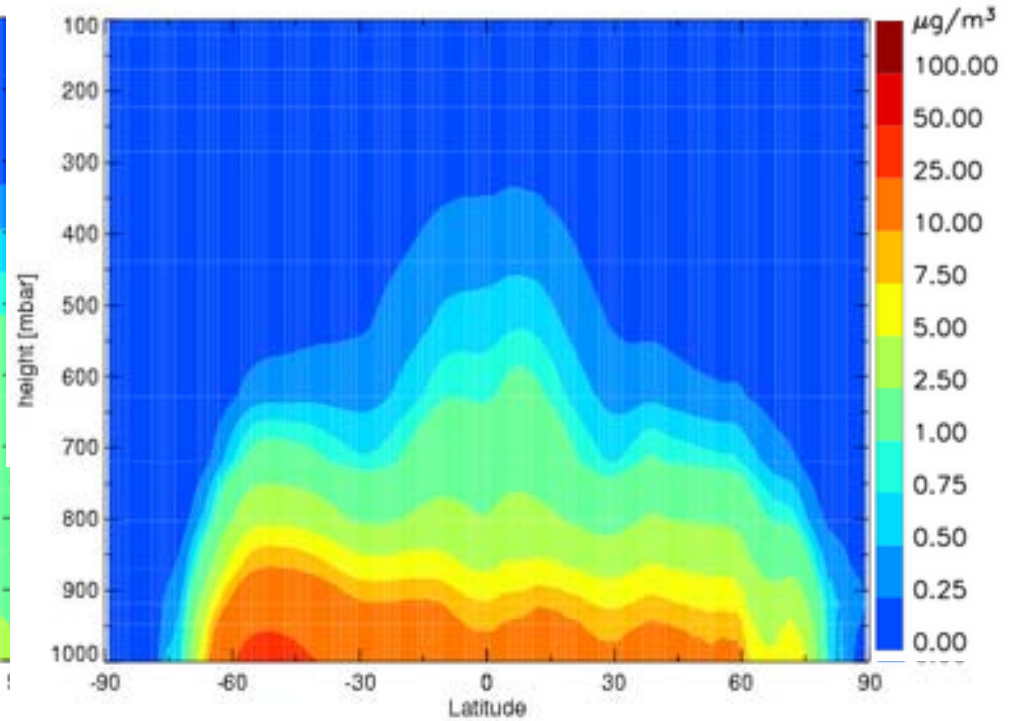
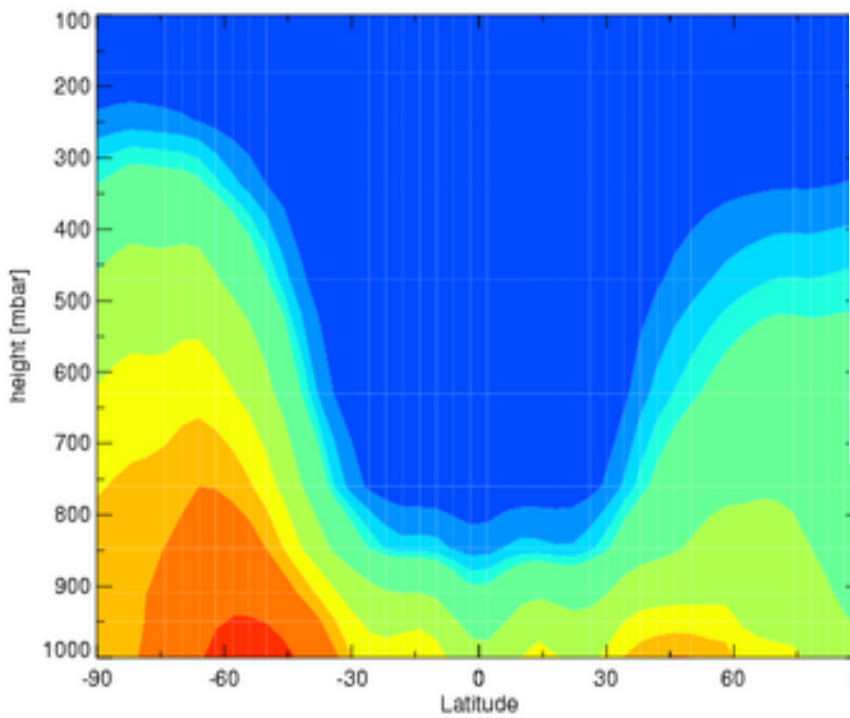
Sarah Guibert

Stefan Kinne

Annual mean zonal mean vertical aerosol concentration

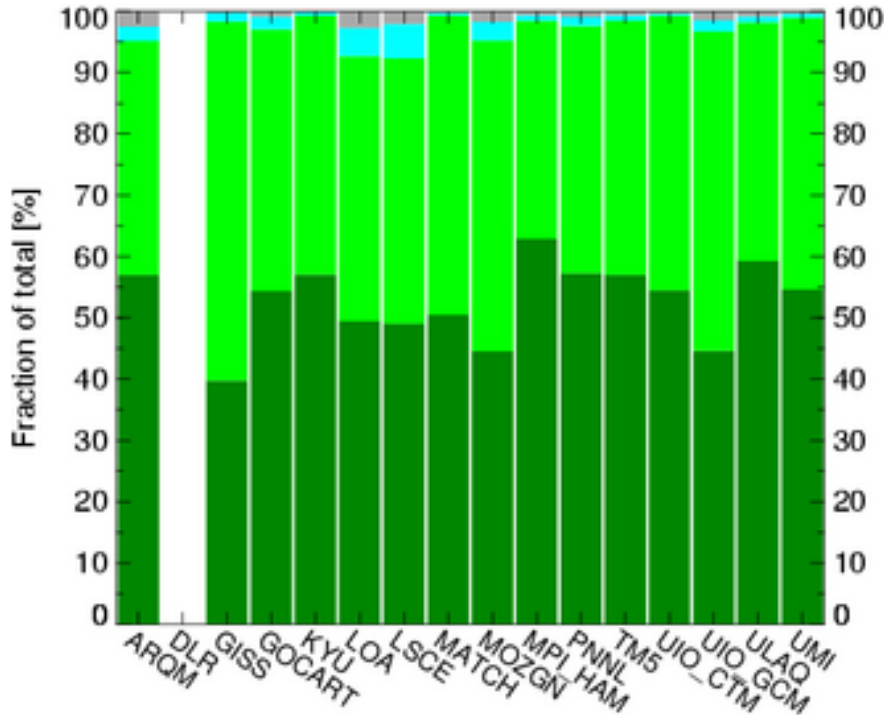


SeaSalt concentration annual mean zonal mean

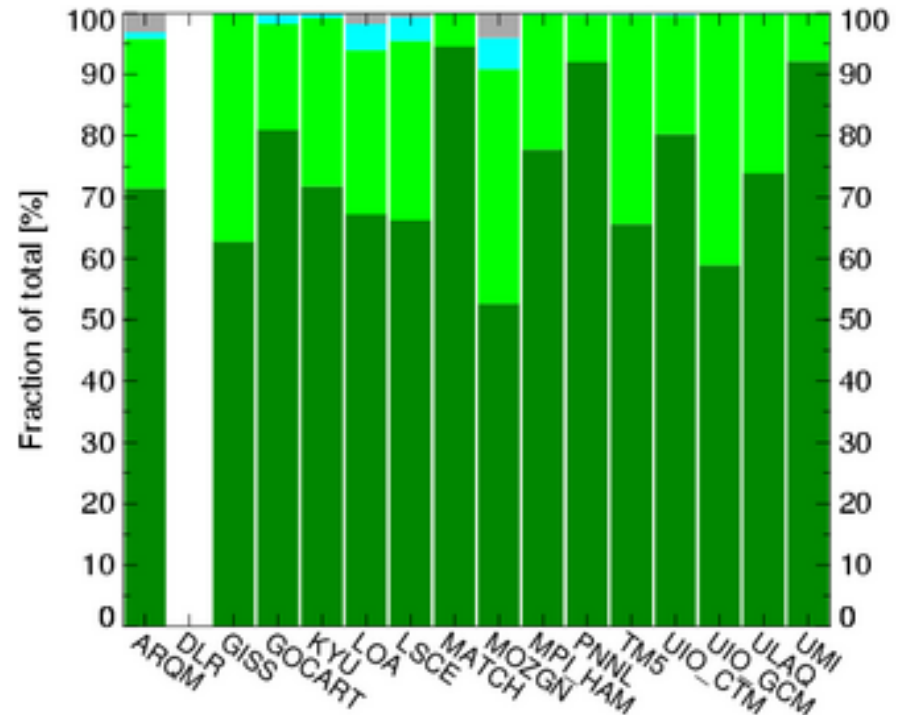


Stratification: Global annual mean mass fraction per altitude interval

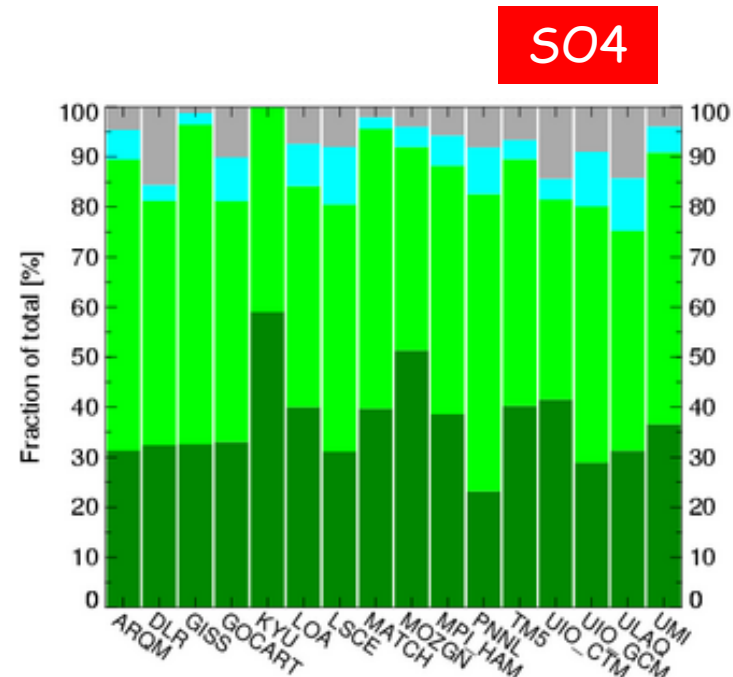
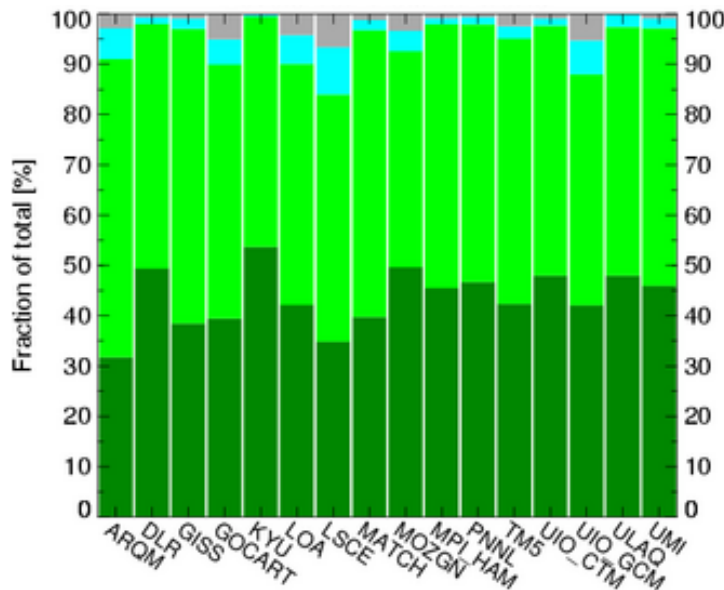
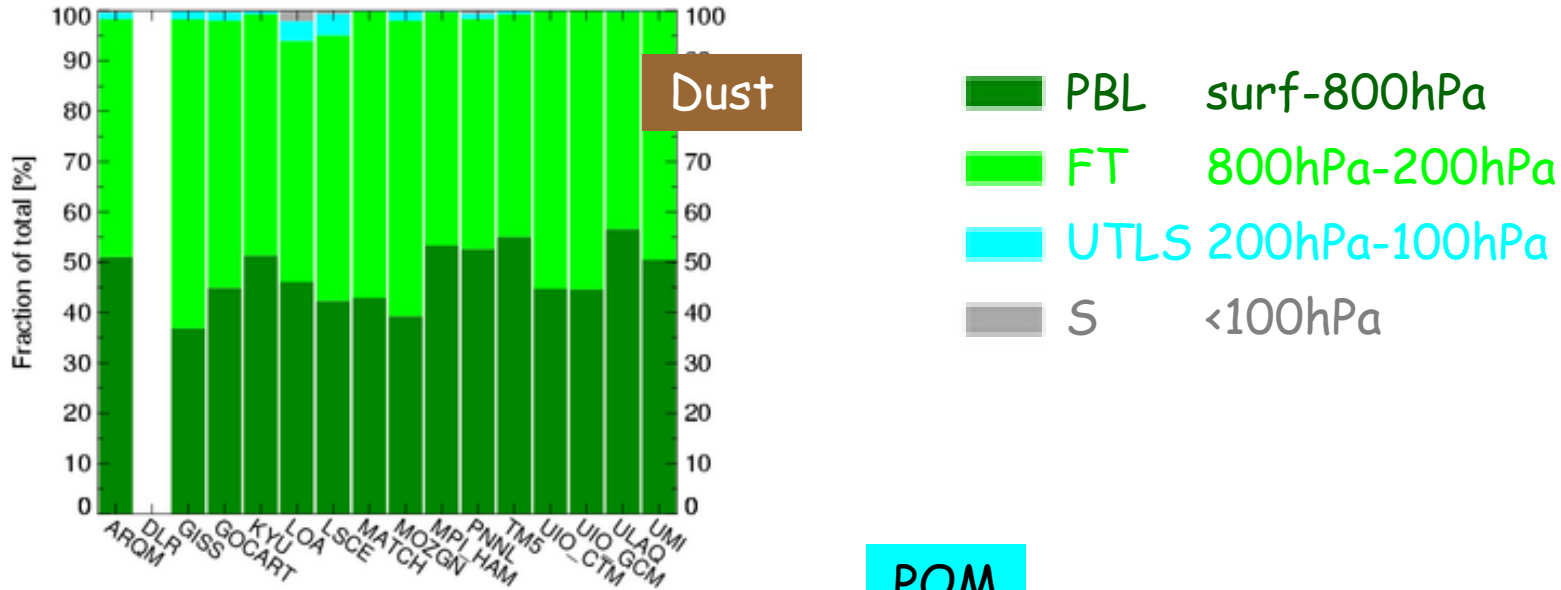
Total Aerosol



SeaSalt

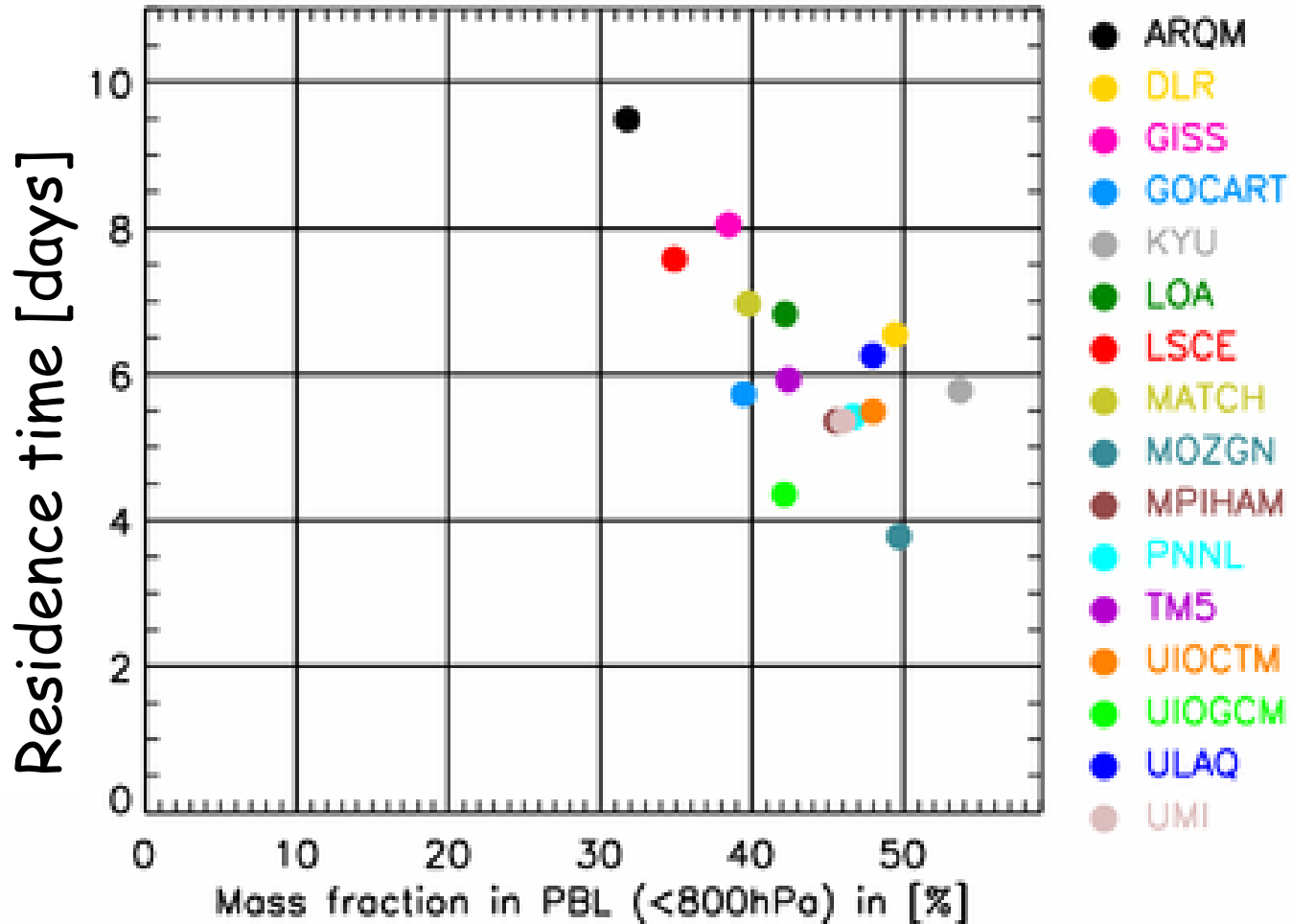


Stratification: Global annual mean mass fraction per altitude interval



Residence time and altitude

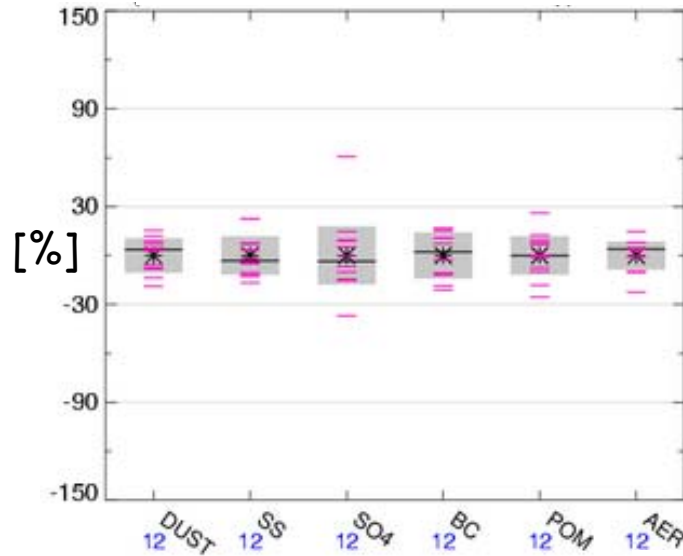
POM: Residence time vs mass fraction in PBL



The greater the altitude the longer the residence time or vice versa?

Uncertainty for stratification: mass fraction per height interval

PBL surf-800hPa

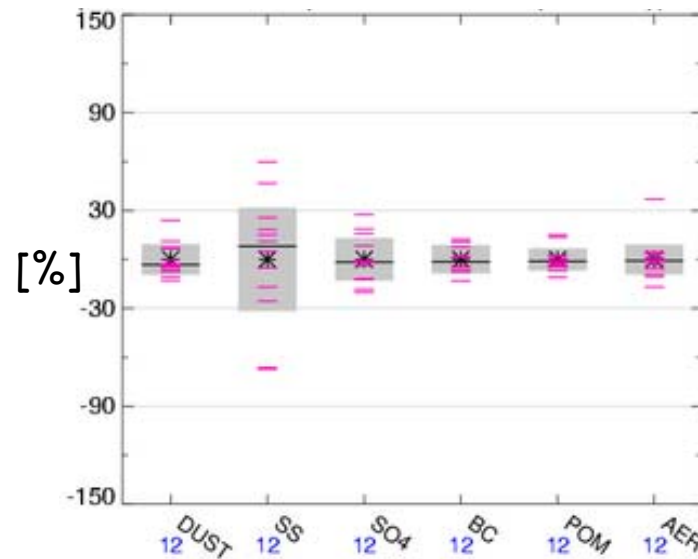


Uncertainty U:
twice the average absolute deviation from the all-models-mean of the normalized data

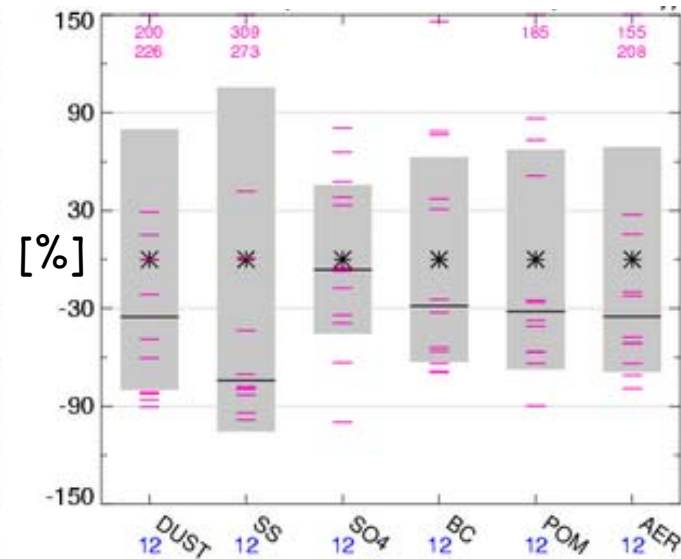
$$U = \frac{2}{N} \sum_{i=1}^N |\text{data}|$$

FT 800hPa-200hPa

- norm. data
- * mean
- median
- uncertainty

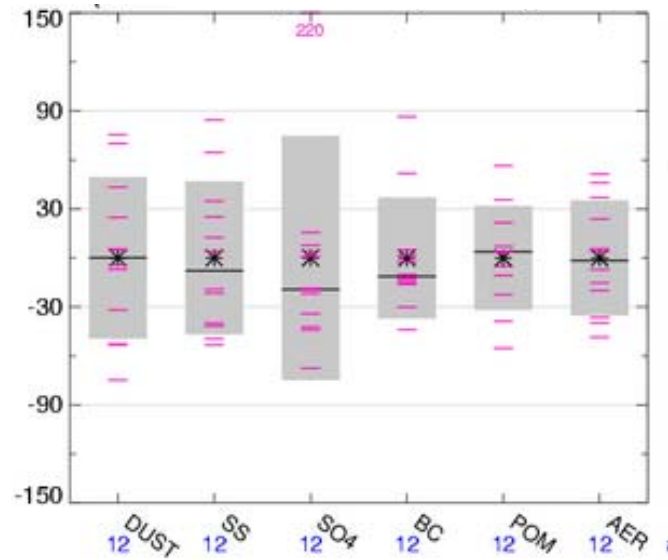


UTLS 200hPa-100hPa



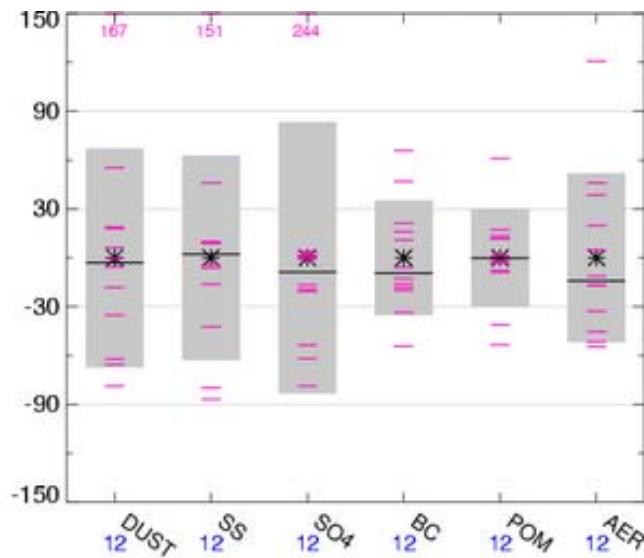
Uncertainty for load: mass per height interval

PBL surf-800hPa

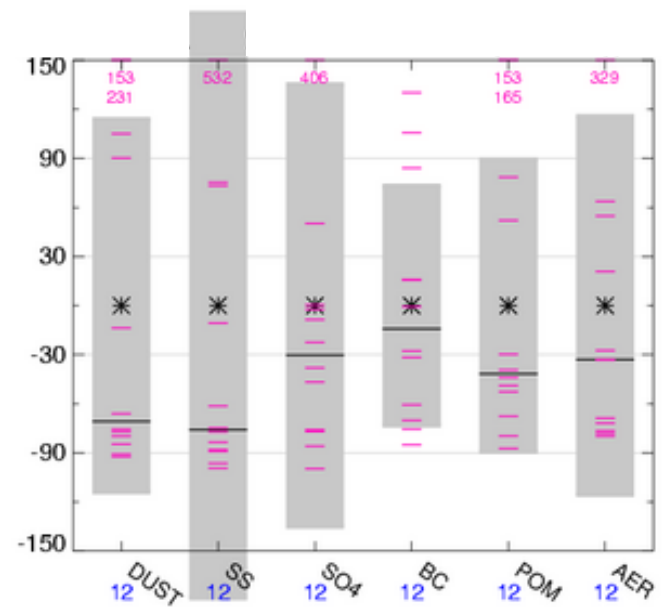


FT 800hPa-200hPa

— norm.data
 * mean
 — median
 ■ uncertainty



UTLS 200hPa-100hPa



Conclusions

- Large disagreement of vertical aerosol distribution
→ due to transport or sink processes?
- Better agreement on stratification
than on mass per height level
- SO₄ and POM at greater altitudes
→ chemical sources?