poster sessions

modeling	**(13)**
data	**(12)**
impact	**(7)**

8th AeroCom meeting
Princeton, NJ, 2009

session 1 MODELING

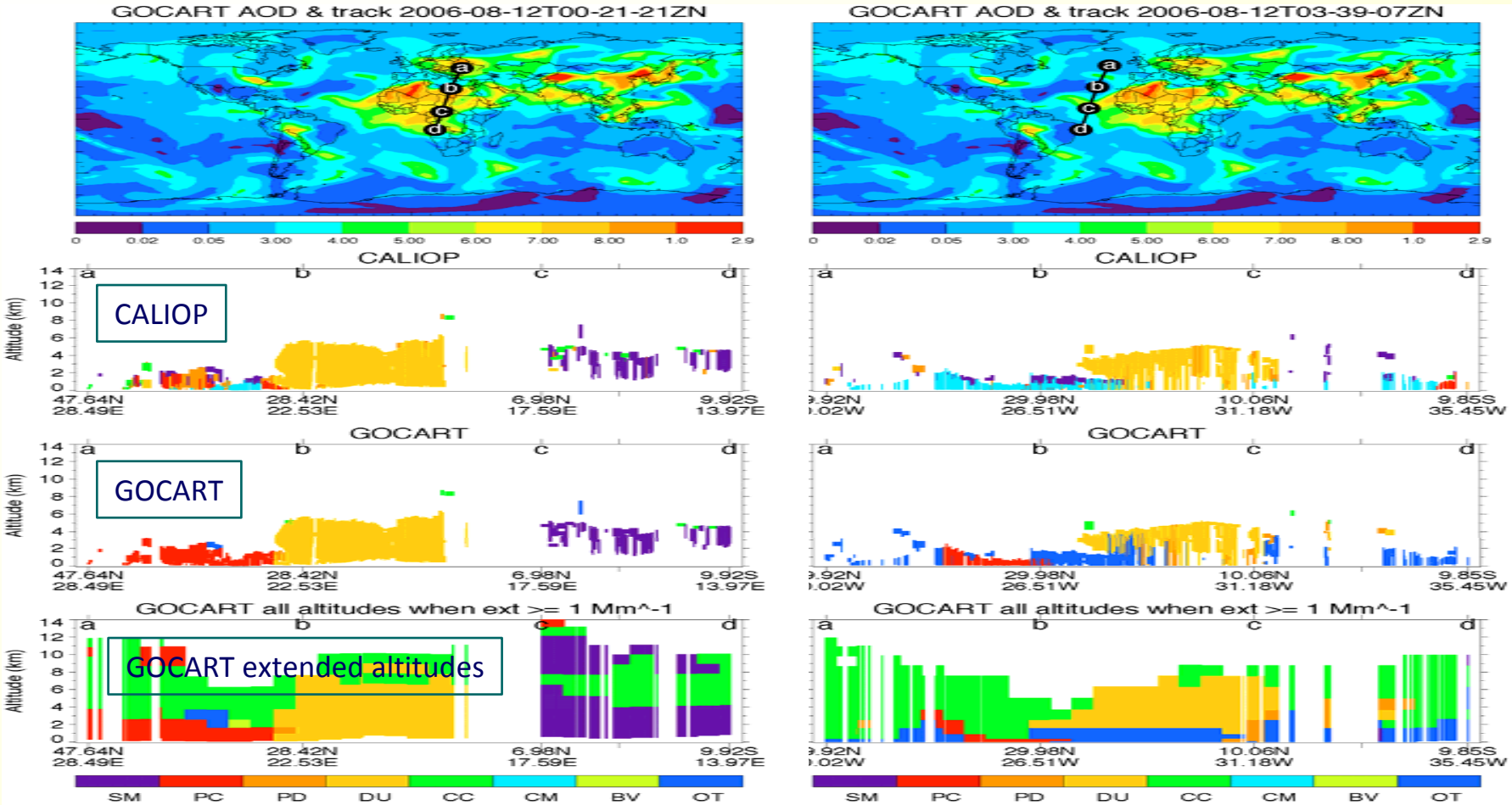
- **MONDAY**

session 1 MODELING

- **Bian**
  - evaluation of aerosol fine mode simulations with GOCART

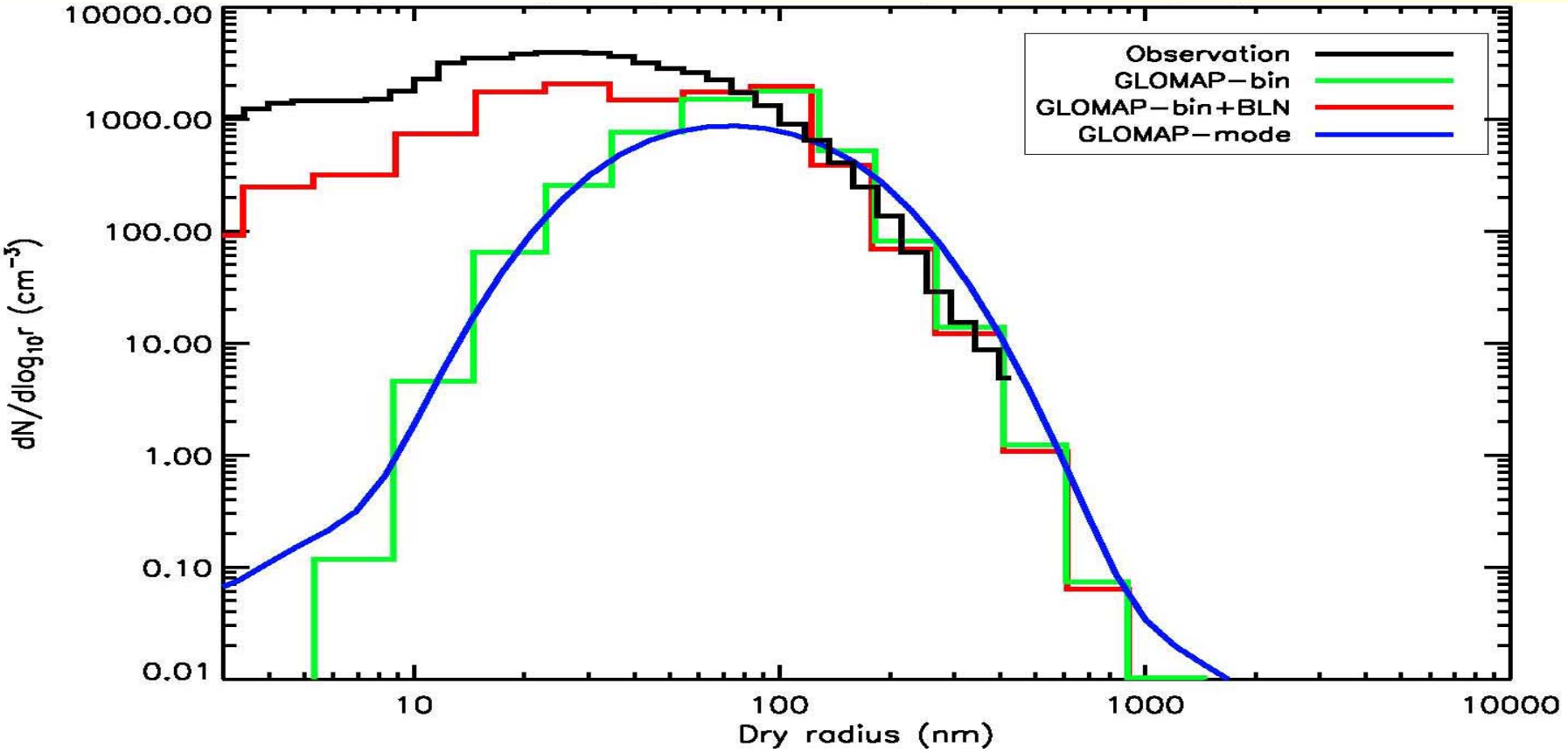
session 1 MODELING

- **Chin**
  - lidar ratio & aerosol type, CALIPSO vs GOCART



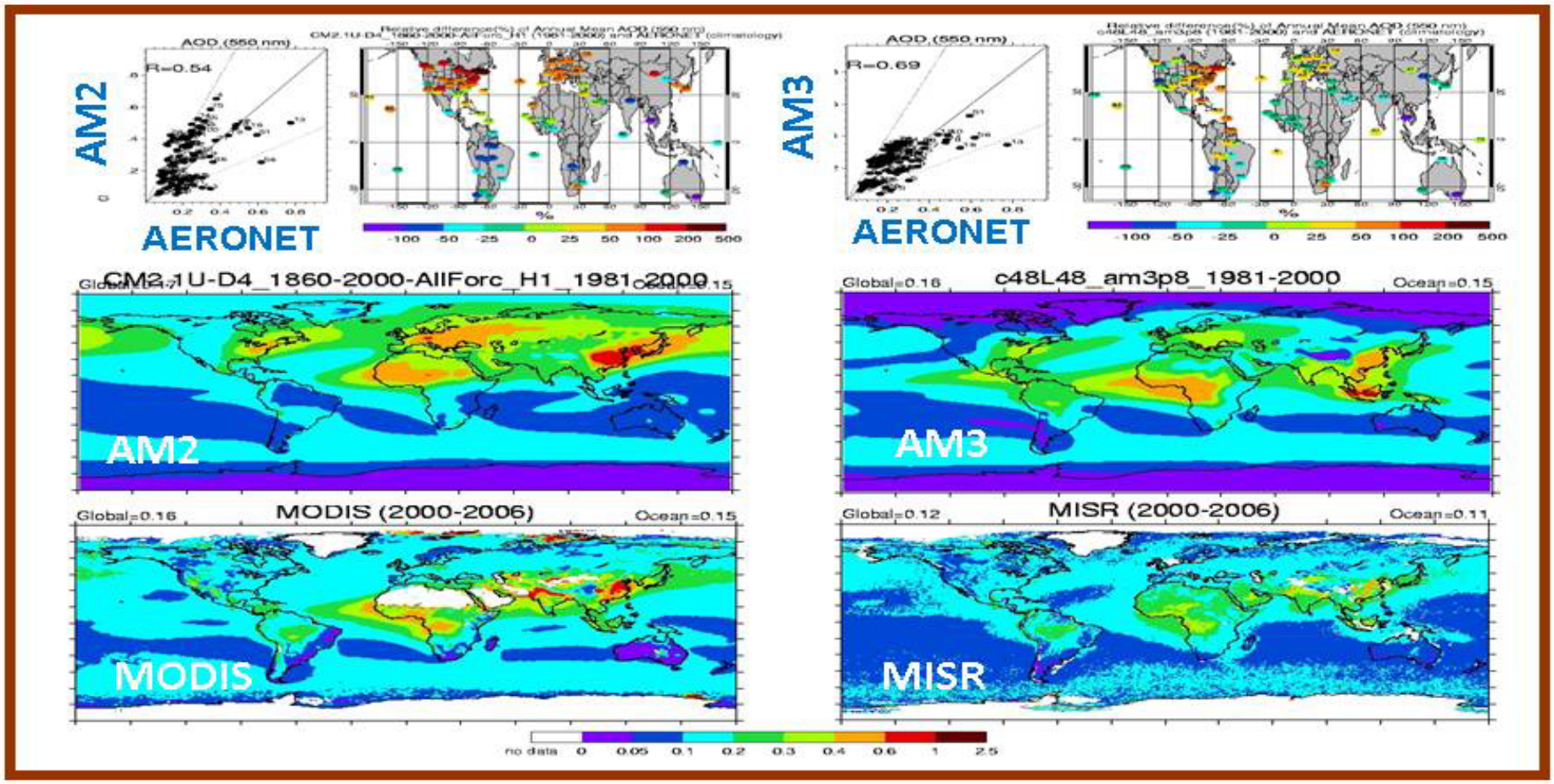
session 1 MODELING

- **Frontoso**
  - Multi-scale integration in EUCAARI



session 1 MODELING

- **Ginoux**
  - aerosol modeling with GFDL AM3



session 1 MODELING

- **Kim**
  - the NCEP dust aerosol modeling system

session 1 MODELING

- **Magi**
  - organic carbon absorption over biomass burning regions

session 1 MODELING

Penner

- cirrus clouds in a global climate model with a statistical cloud scheme

new cirrus scheme based on K/B 2008 introduces PDFs for temperature and saturation ratio to mimic sub-grid scale mesoscale variability:

$$dP_T/dT,\ dP_S/dS$$

cloud fraction determined by portion of grid with *S* above critical supersat.

Aviation forcing for long-lived cirrus effects:

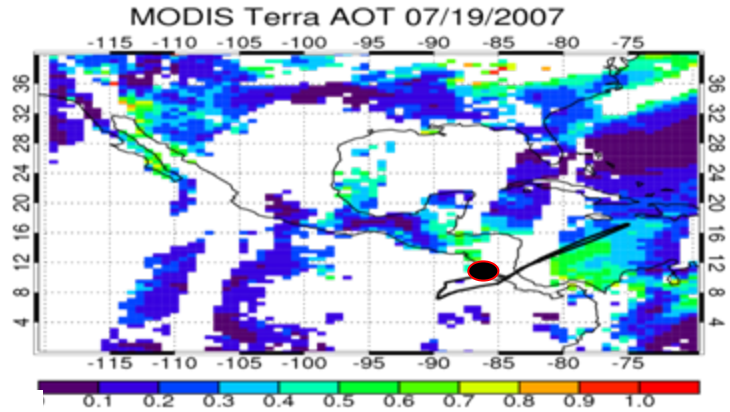
Penner et al., 2009:	**-0.16 W/m²**
This work:	-0.09 W/m²
This work with Lee 2009:	-0.08 W/m²

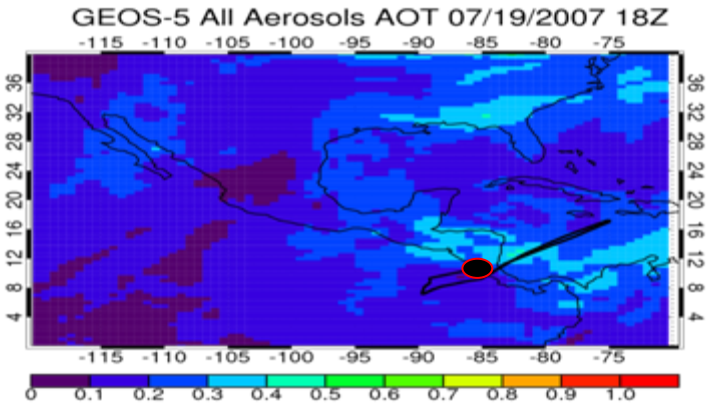
Comparison of new mass-only model with Liu et al. (2009) model, CAM3, and obs:

	NEW	Liu	CAM	Obs.
LWP g m^{-2}	76	141	121	50-87
IWP g m^{-2}	21	22	16	27
SWCF Wm^{-2}	-51	-59	-57	-47 -54
LWCF W m^{-2}	27	32	31	29-30
netCF W m^{-2}	-25	-27	-24	
CLDTOT %	67	78	59	65-67
CLDHGH %	38	57	32	21

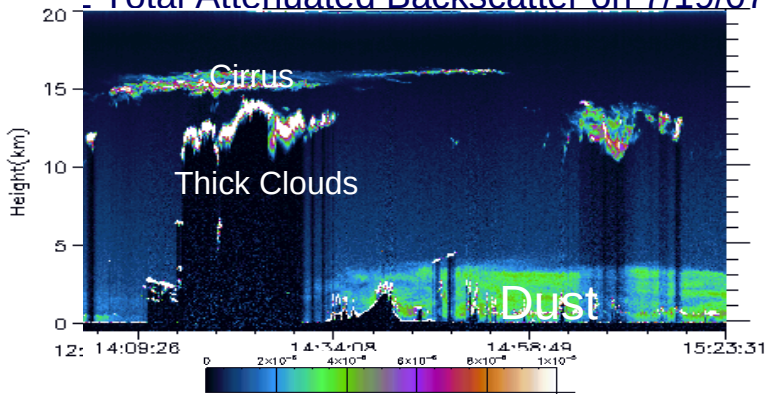
session 1 MODELING

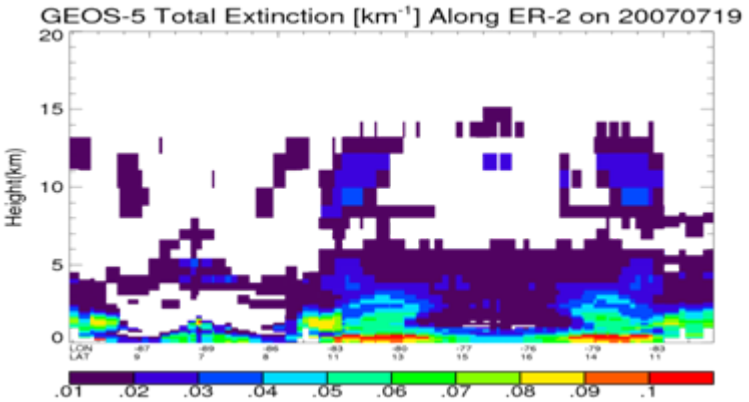
- **Nowottnick**
  - Saharan dust event during the NASA TC-4





- Total Attenuated Backscatter on 7/19/07





session 1 MODELING

- **Righi**
  - the global aero model ECHAM5/MESSy1-MADE

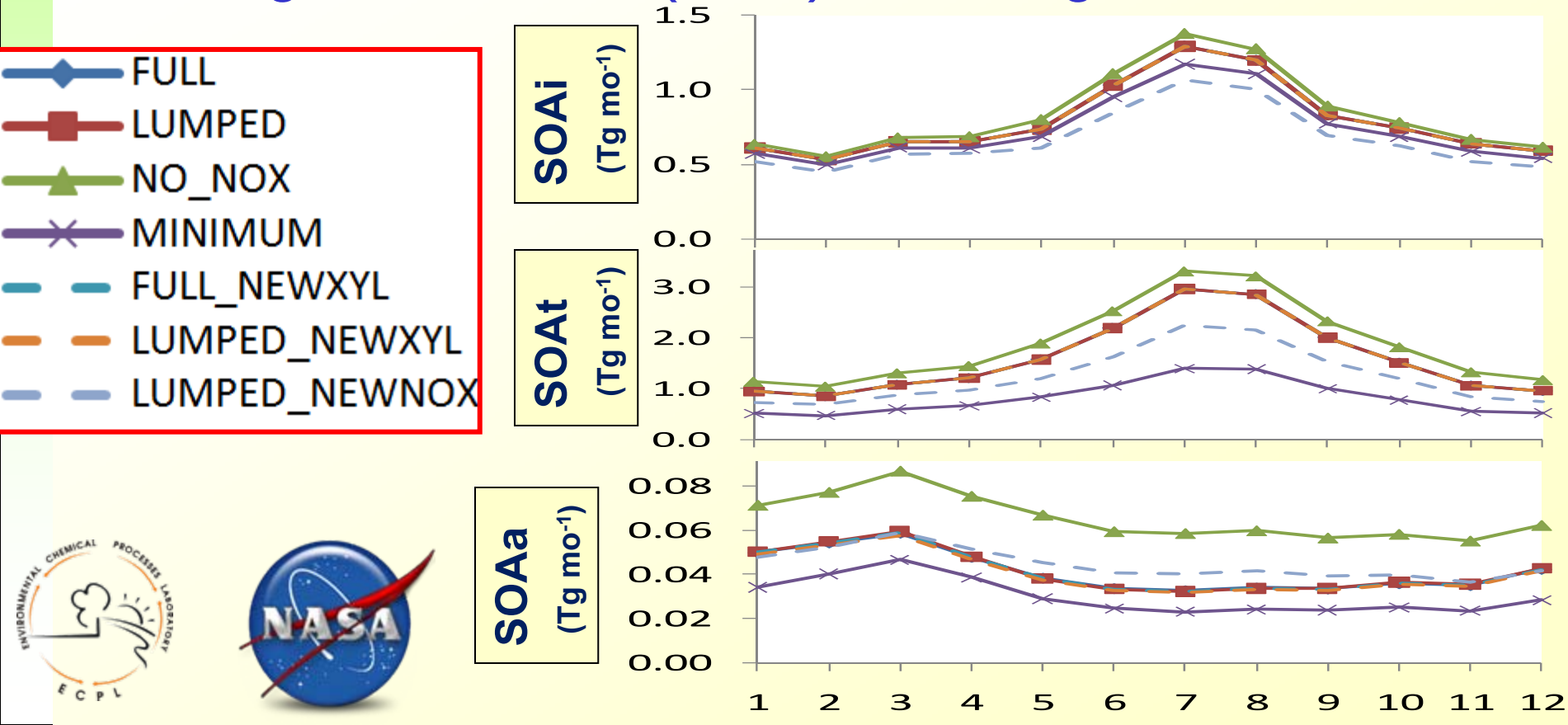
- **MADE describes the aerosol population with 3 log-normal modes and simulates particle concentration, chemical composition and size distribution. It includes several aerosol species, micro-physical processes and tropospheric aerosol precursor chemistry**
- **The impact of international shipping on aerosol and climate is shown as an example of application**
- **The extension MADE-soot describes the aerosol population with 7 log-normal modes and simulates particle concentration, chemical composition, size distribution and mixing state of BC and dust**
- **MADE-soot has been applied to study the population of potential ice nuclei (BC and dust particles) and their aging processes**

session 1 MODELING

- **Rumbold**
  - source-receptor studies of global aerosol transport

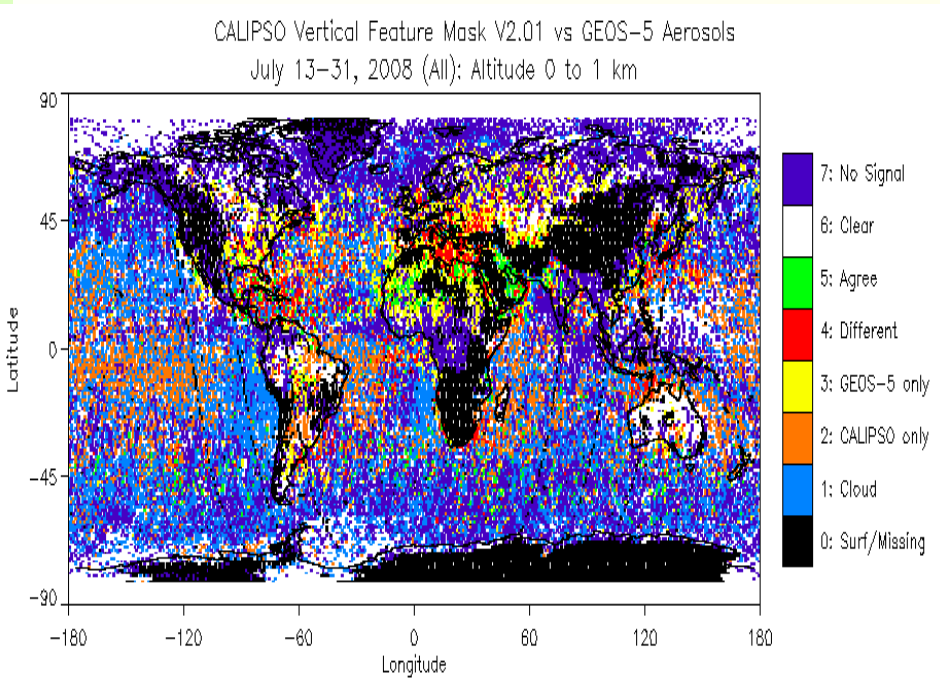
session 1 MODELING

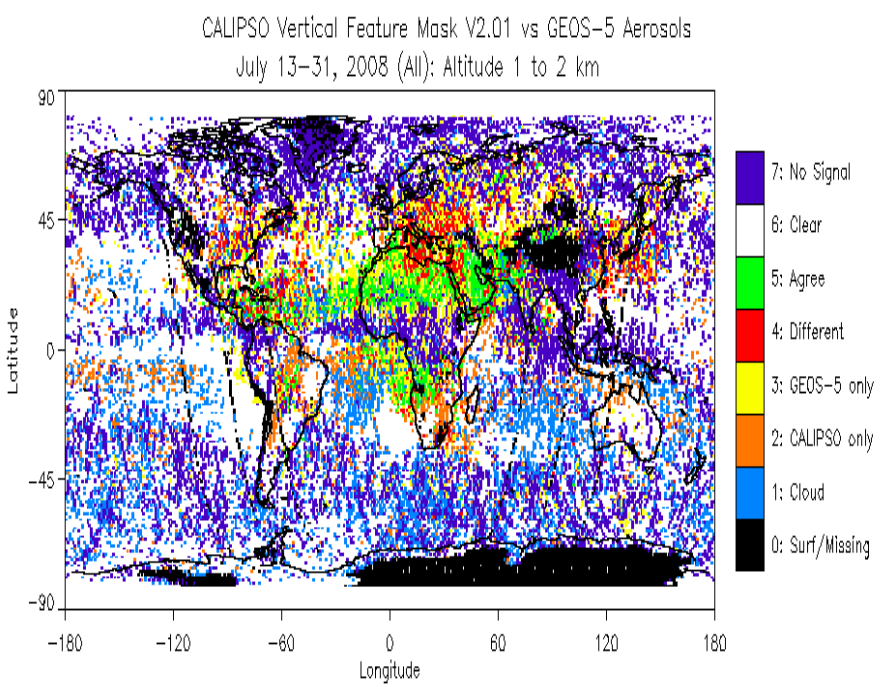
- **Tsigaridis**
  - simplicity versus accuracy In global Secondary Organic Aerosol (SOA) modeling

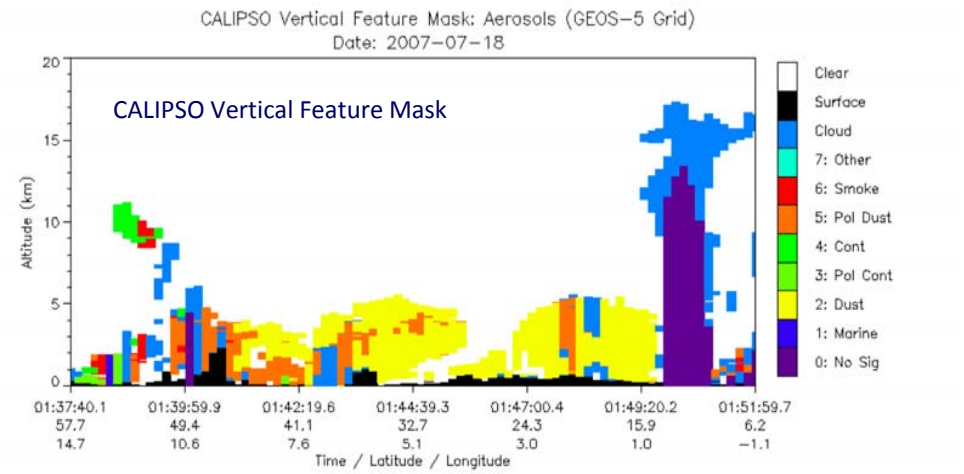


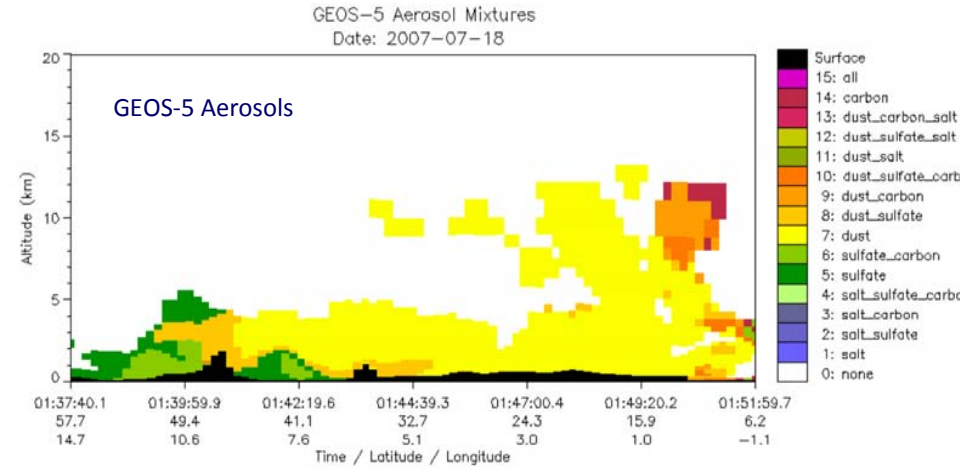
session 1 MODELING

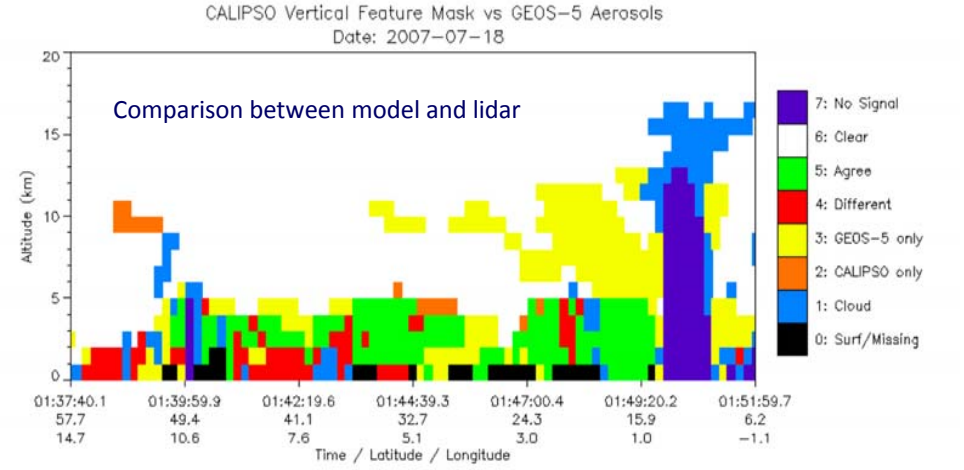
- **Welton**
  - comparisons of aerosol type from CALIPSO feature mask and GEOS-5

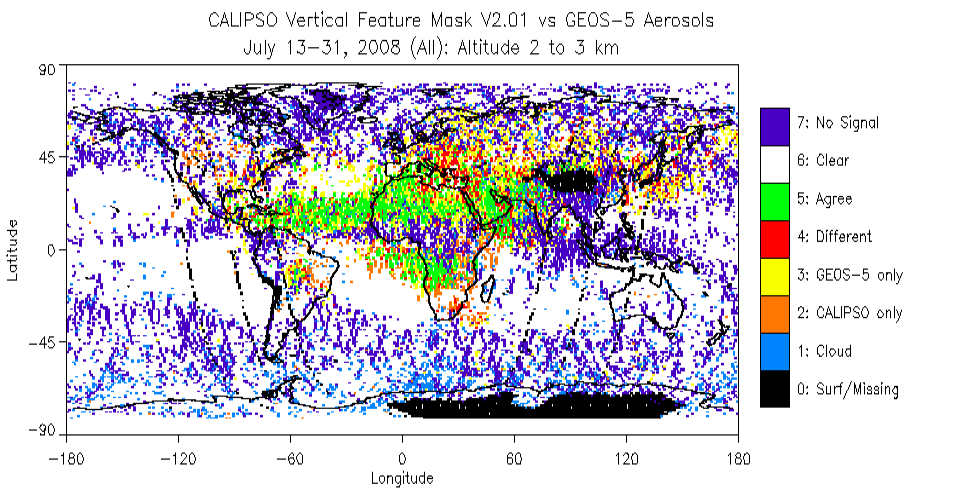


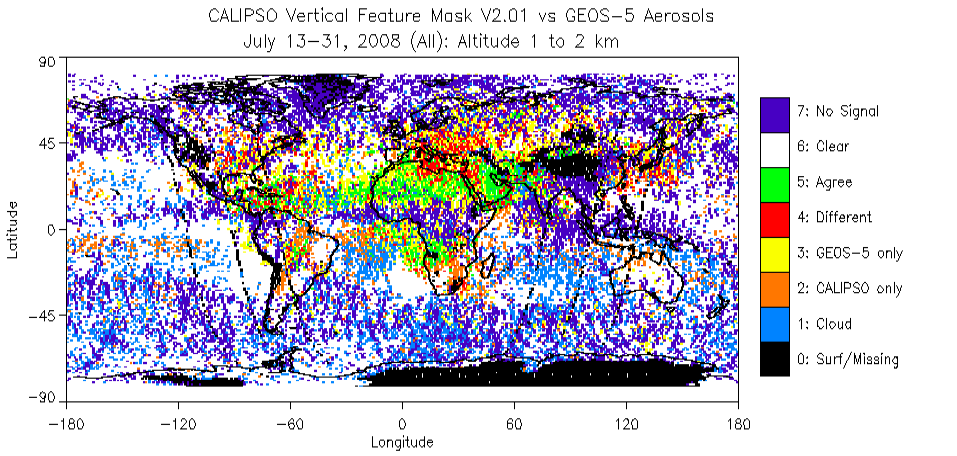


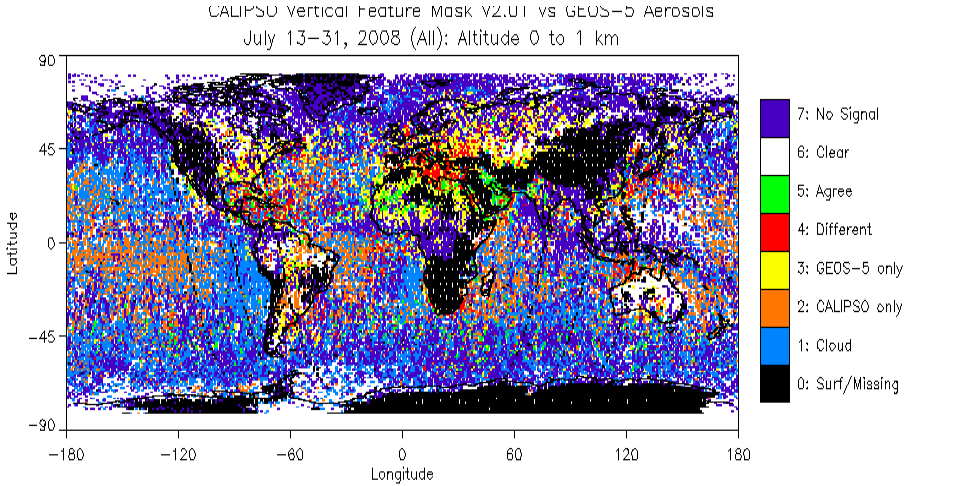

CALIPSO Vertical Feature Mask: Aerosols (GEOS-5 Grid)
Date: 2007-07-18
CALIPSO Vertical Feature Mask
Clear
Surface
Cloud
7: Other
6: Smoke
5: Pol Dust
4: Cont
3: Pol Cont
2: Dust
1: Marine
0: No Sig
Altitude (km)
Time / Latitude / Longitude


GEOS-5 Aerosol Mixtures
Date: 2007-07-18
GEOS-5 Aerosols
Surface
15: all
14: carbon
13: dust_carbon_salt
12: dust_sulfate_salt
11: dust_salt
10: dust_sulfate_carb
9: dust_carbon
8: dust_sulfate
7: dust
6: sulfate_carbon
5: sulfate
4: salt_sulfate_carbo
3: salt_carbon
2: salt_sulfate
1: salt
0: none
Altitude (km)
Time / Latitude / Longitude


CALIPSO Vertical Feature Mask vs GEOS-5 Aerosols
Date: 2007-07-18
Comparison between model and lidar
7: No Signal
6: Clear
5: Agree
4: Different
3: GEOS-5 only
2: CALIPSO only
1: Cloud
0: Surf/Missing
Altitude (km)
Time / Latitude / Longitude


CALIPSO Vertical Feature Mask V2.01 vs GEOS-5 Aerosols
July 13-31, 2008 (All): Altitude 2 to 3 km
7: No Signal
6: Clear
5: Agree
4: Different
3: GEOS-5 only
2: CALIPSO only
1: Cloud
0: Surf/Missing
Latitude
Longitude

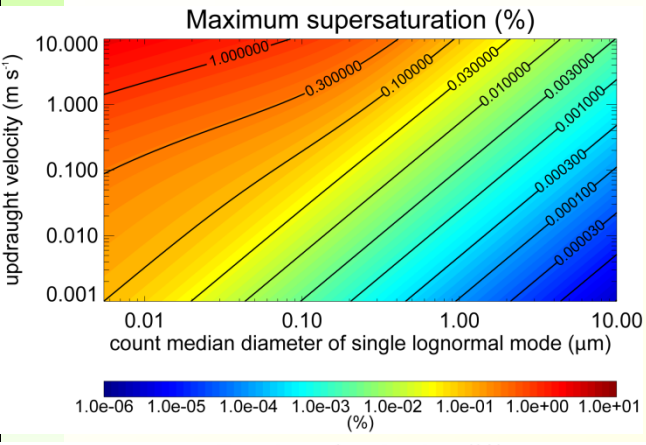

CALIPSO Vertical Feature Mask V2.01 vs GEOS-5 Aerosols
July 13-31, 2008 (All): Altitude 1 to 2 km
7: No Signal
6: Clear
5: Agree
4: Different
3: GEOS-5 only
2: CALIPSO only
1: Cloud
0: Surf/Missing
Latitude
Longitude

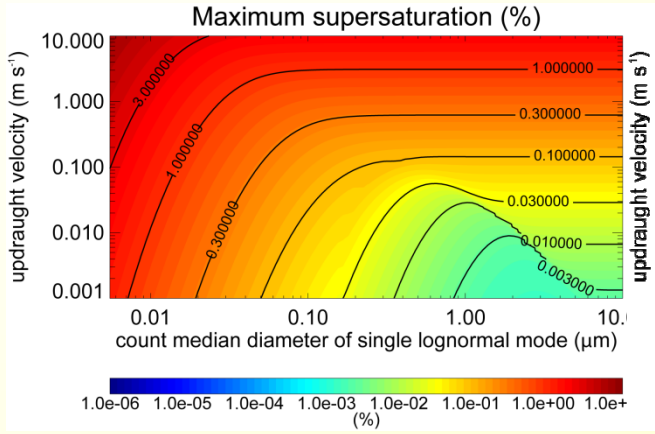

July 13-31, 2008 (All): Altitude 0 to 1 km
7: No Signal
6: Clear
5: Agree
4: Different
3: GEOS-5 only
2: CALIPSO only
1: Cloud
0: Surf/Missing
Latitude
Longitude

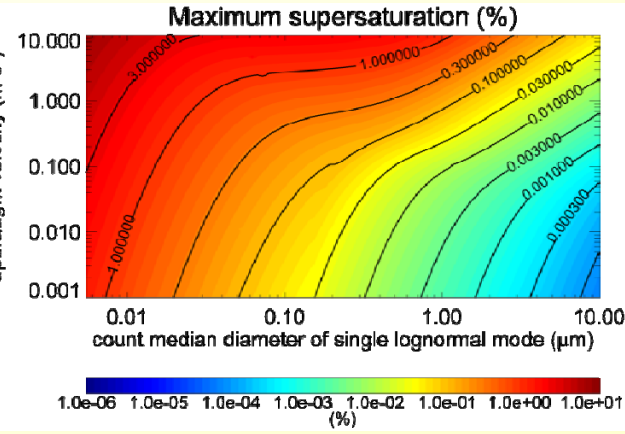
session 1 MODELING

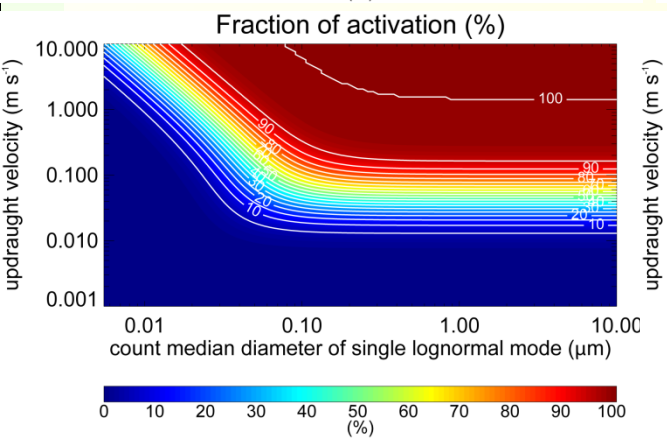
- **West**
  - aerosol activation scheme in UK Met Office model

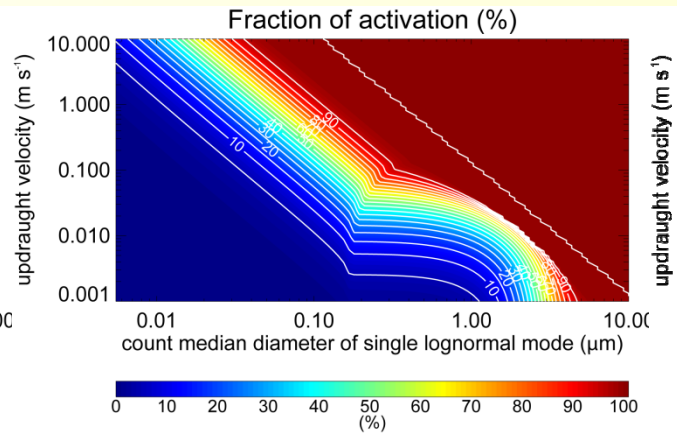
Abdul-Razzak and Ghan | **Nenes et al.** | **Barahona et al.**

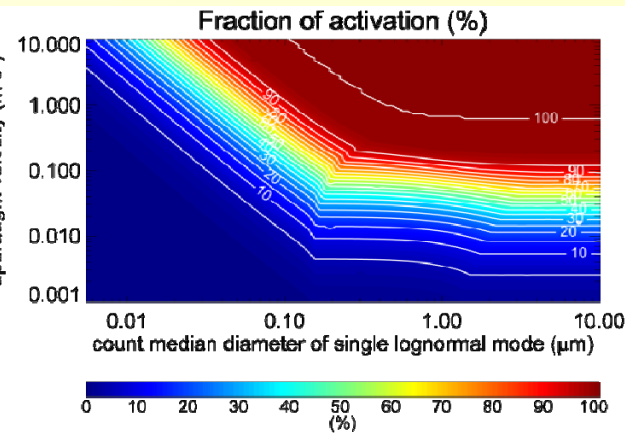










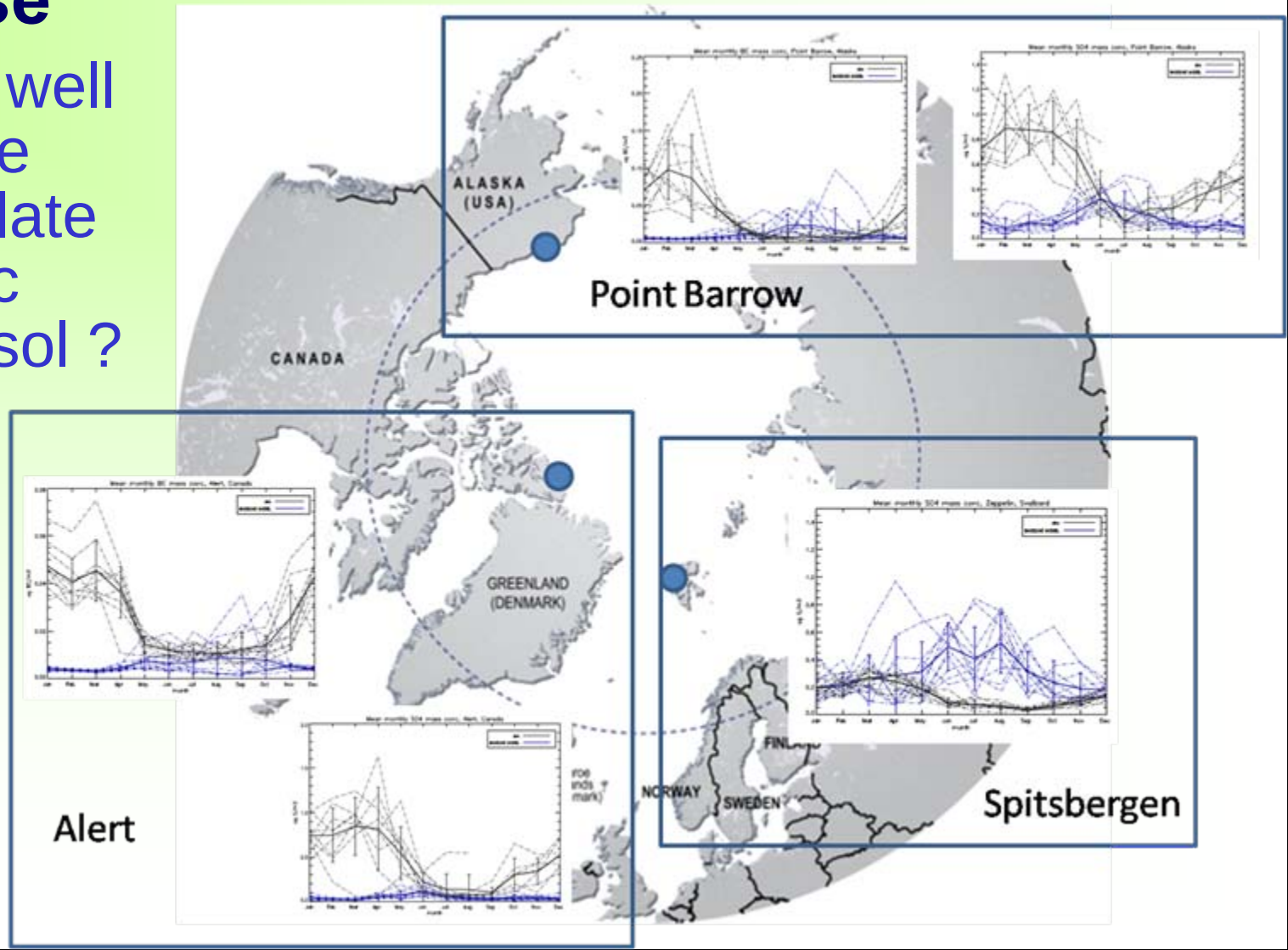


session2 DATA

- TUESDAY

session2 DATA

- **Browse**
  - How well do we simulate Arctic aerosol ?



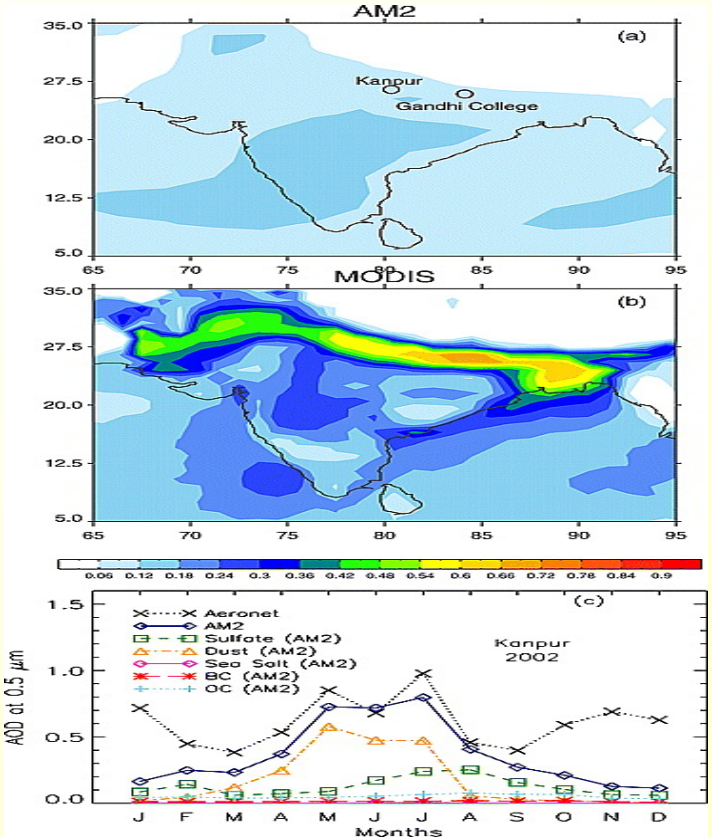
session2 DATA

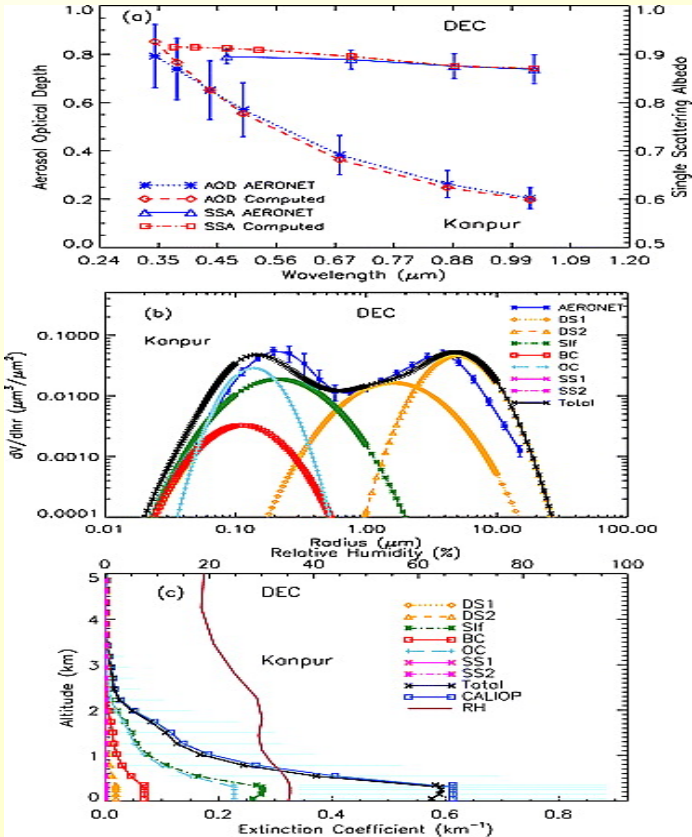
- **Ganguly**
  - inferring aerosol composition by combining AERONET, MPLNET and CALIOP

AM2

MODIS

AM2 and AERONET





session2 DATA

- **Gross**
  - using raman lidar ratios to explore droplet size and indirect effects

session2 DATA

- **Kinne**
  - a generic global monthly aerosol climatology

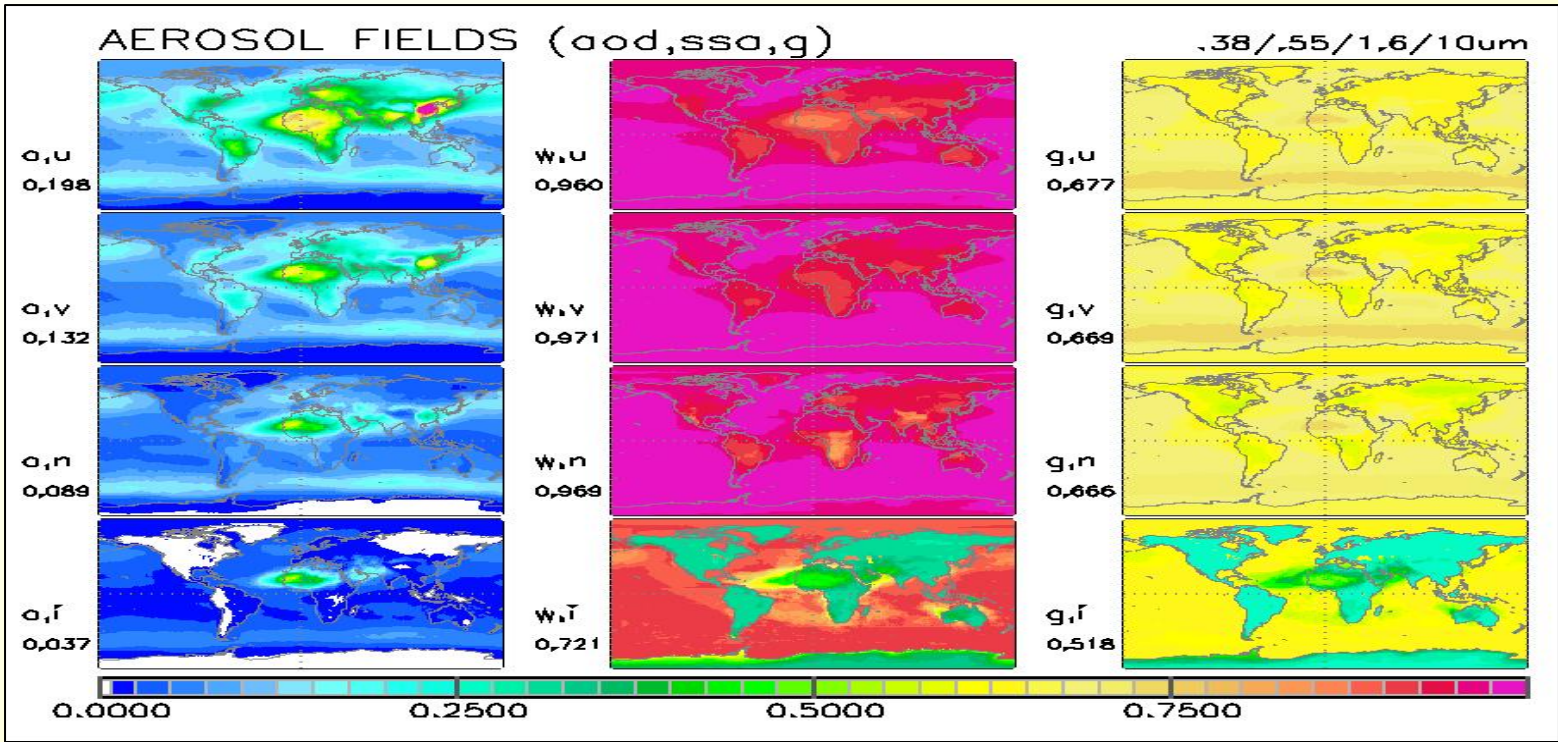
2D maps for ‘AOD’, ‘SSA’ and ‘g’

UV

VIS

n-IR

f-IR

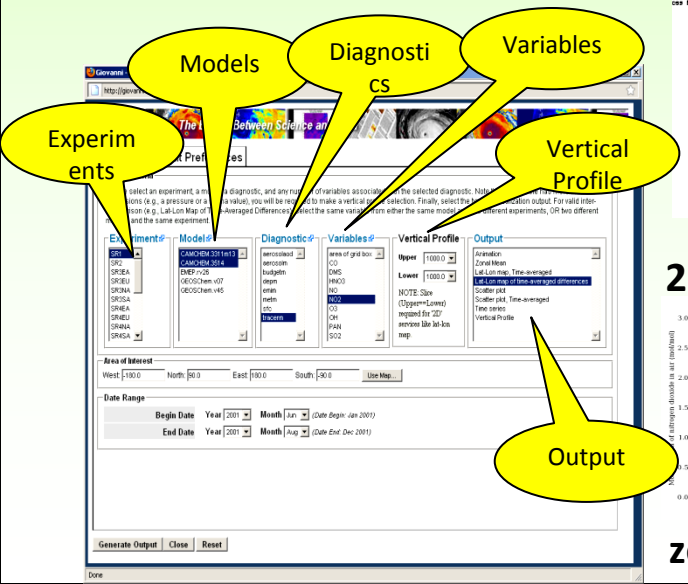


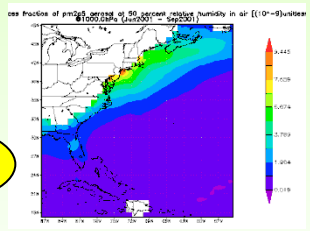
session2 DATA

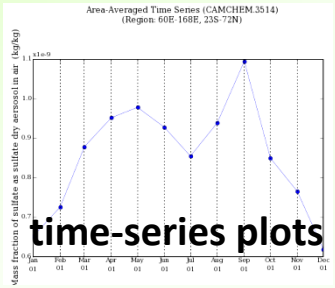
- **Leptoukh**
  - Giovanni for HTAP

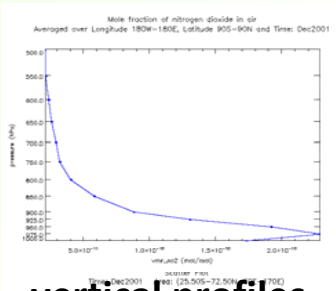
2 options to get harmonized HTAP data into Giovanni:

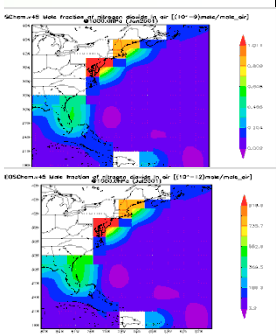
1. “Pre-process” data at NASA-GSFC to harmonize data
2. Get data directly from Juelich HTAP archive via WCS – on-the-fly harmonization @Juelich

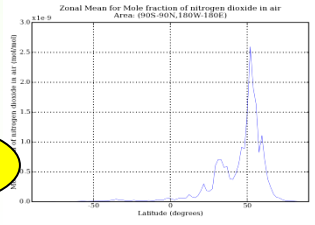


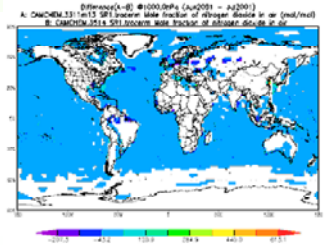


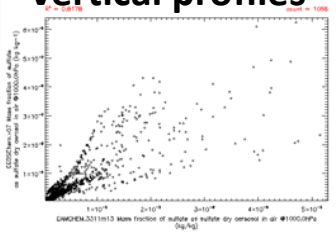


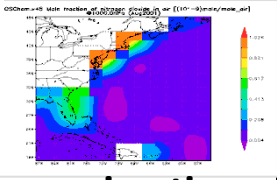






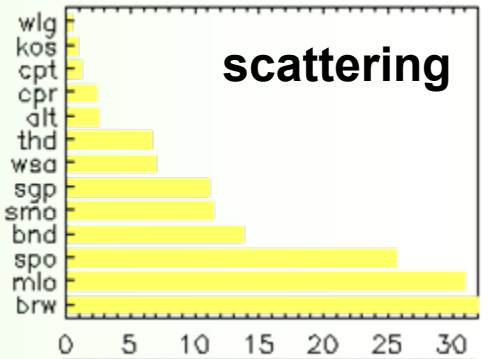


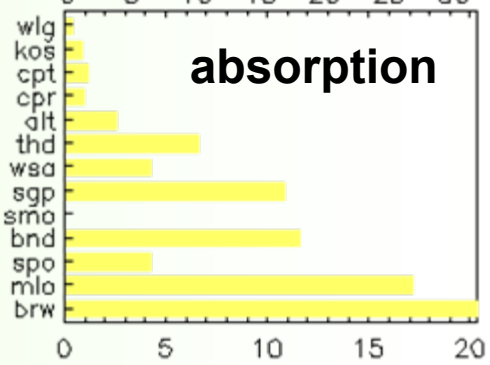




session2 DATA

- **Ogren**
  - climatology of near surface aerosol scattering and absorption

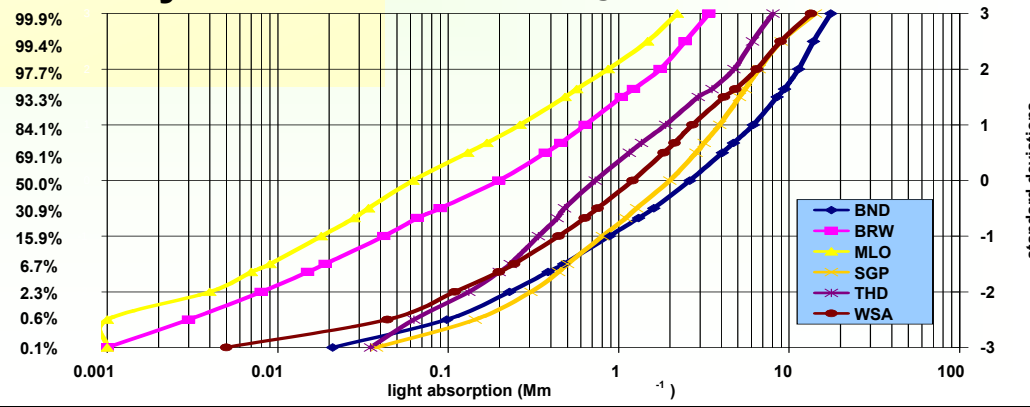




years of data

- **emphasis on radiative properties**
- **network is expanding**
- **data available through NILU**
- **current station-years of data:**
  - **scattering (146),**
  - **bsorption (64)**
  - **backscattering (71)**
  - **sub-micon scatt/ fraction (64)**

Note: aerosol light absorption is not log-normally distributed



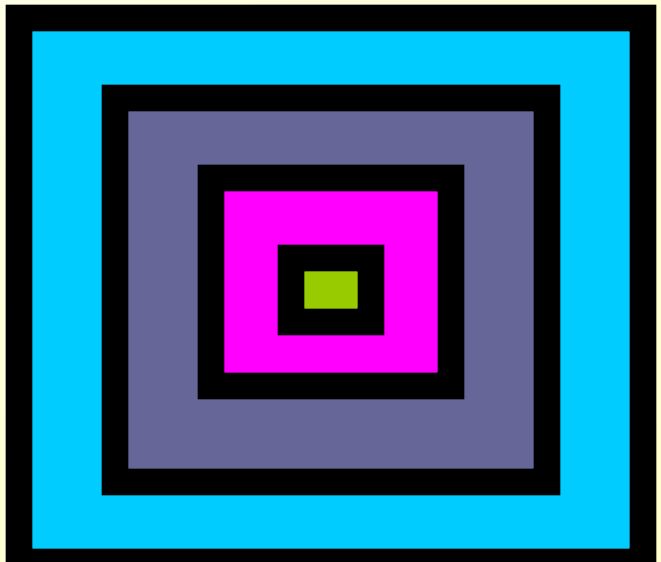
session2 DATA

- **Ottaviano**
  - polarized observations of aerosols and clouds

session2 DATA

- **Paradise**
  - regional representation investigations with AMAPS

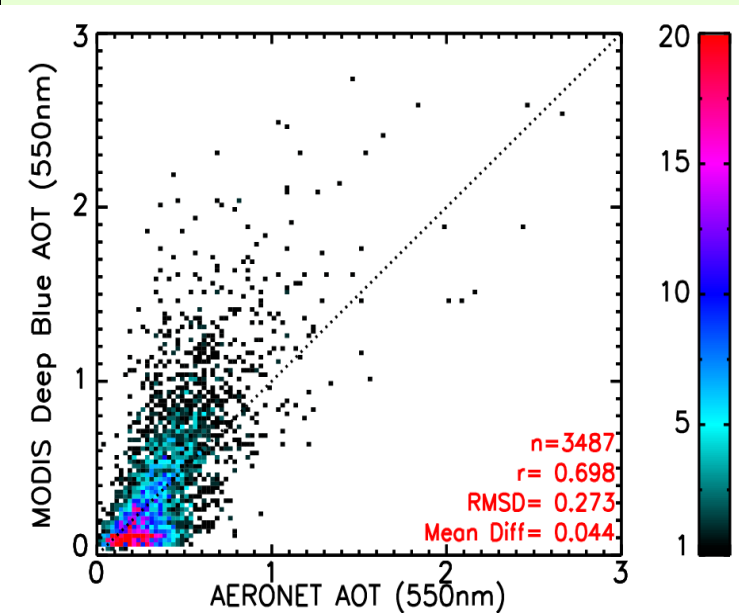
- **how does the local 17.6 km MISR v22 aod value compare to regional averages at**
  - **at 100*100 km ?**
  - **at 300*300 km ?**
  - **at 500*500 km ?**
  - **at 900*900 km ?**



session2 DATA

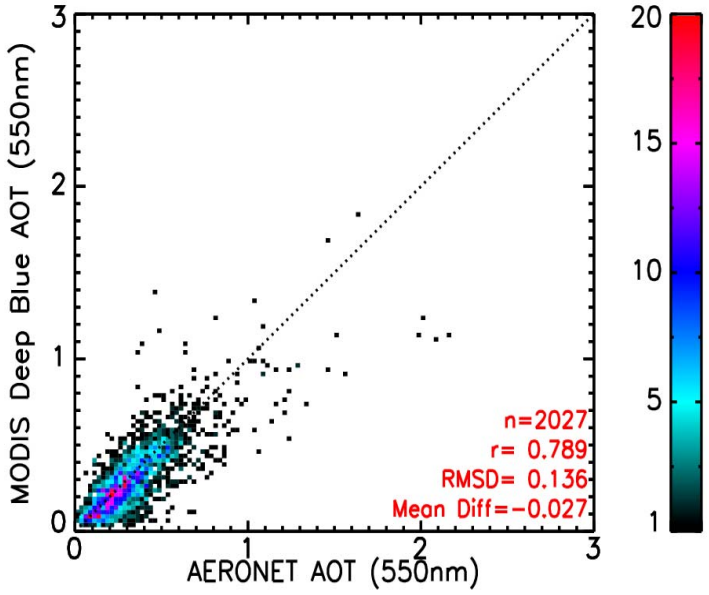
- **Salustro**
  - MODIS Deep Blue

Arabian Peninsula



MODIS
coll 5.0

MODIS
coll. 5.1



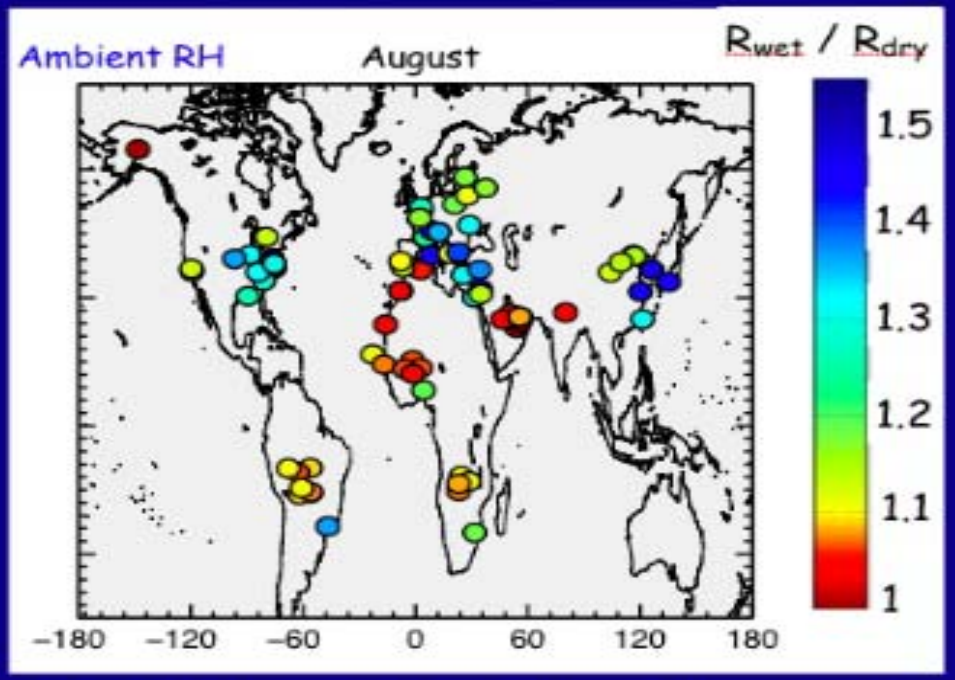
session2 DATA

- **Schuster**
  - remote sensing of water uptake

Once component fractions are known, can compute many aerosol parameters

1. Volume fraction of water
2. Dry Aerosol Volume/Mass
3. Hygroscopic Growth Factor
4. Aerosol Liquid Water Path
5. BC mass
6. Black Carbon Specific Absorption
7. Dry Aerosol Optical Depth
8. Dry Single Scatter Albedo

Regional hygroscopic growth is consistent with climate

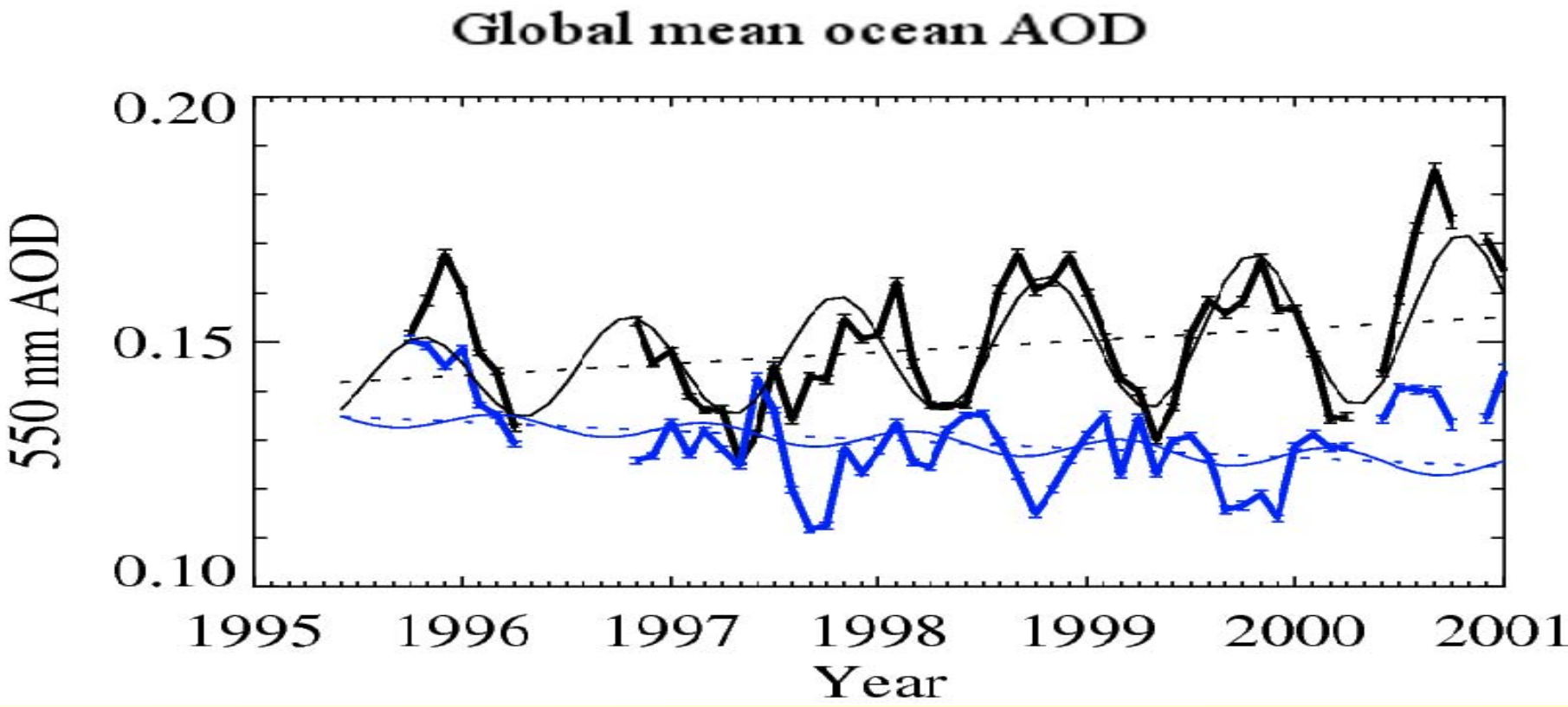


AERONET all-points, level 2.0 dataset, 10 retrievals min.

http://asd-www.larc.nasa.gov/~gregs/Beta_dstrbtn_20090220/

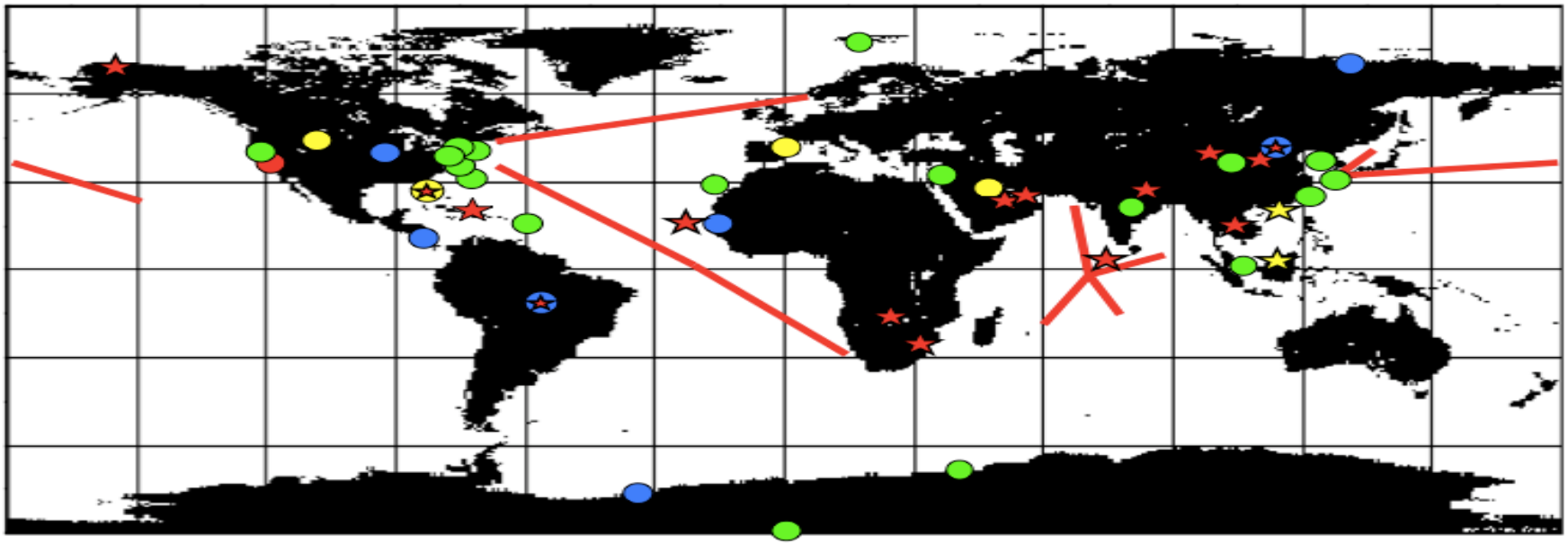
session2 DATA

- **Thomas**
  - What can the GRAPE aerosol dataset tell us about the long term global AOD trend ?



session2 DATA

- **Welton**
  - MPLNET Products for AeroCom validations



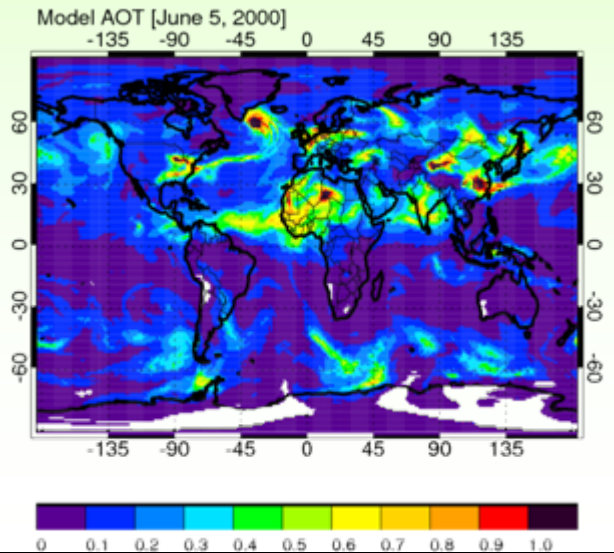
session 3 IMPACT

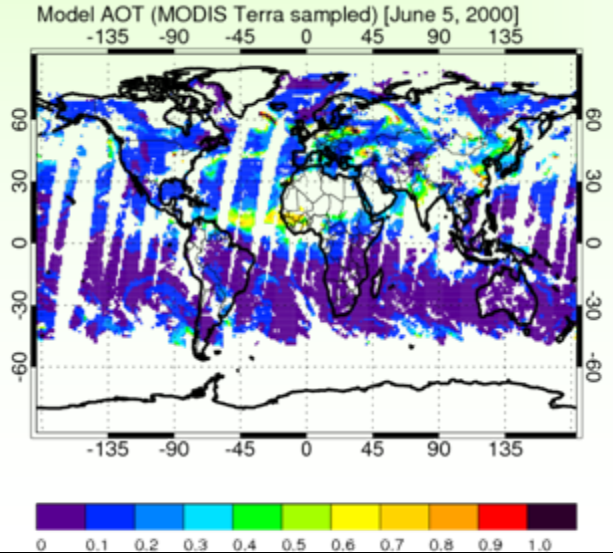
- **WEDNESDAY**

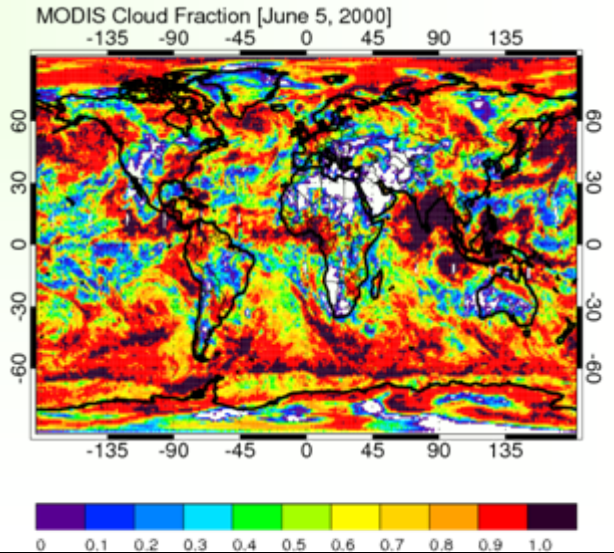
session 3 IMPACT

- **Colarco**
  - aerosol impacts in GEOS4/5 GCM simulations

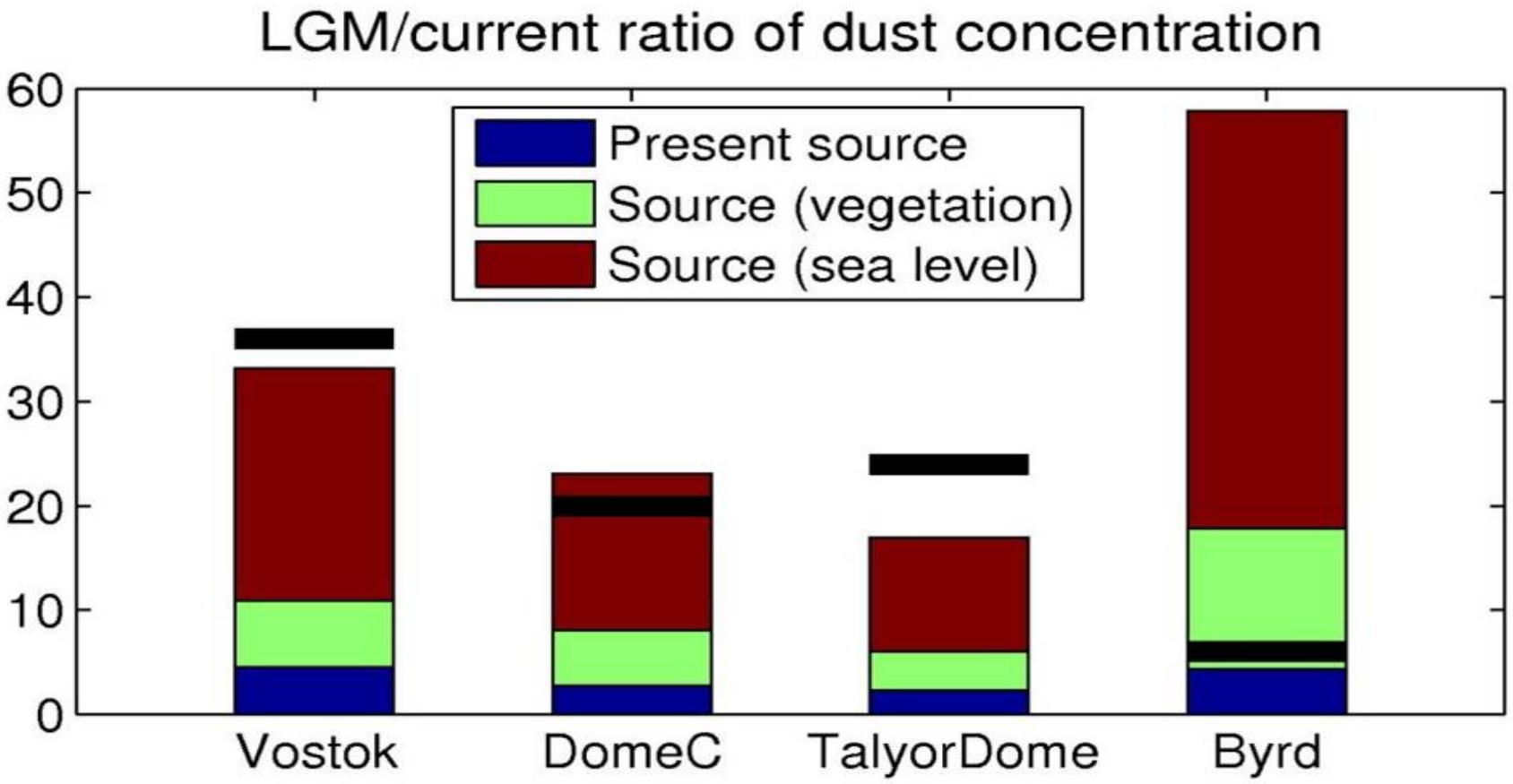
✓ “Operational” ¼° global aerosol forecasts
✓ Preliminary aerosol-climate simulations
✓ Evaluation of hindcast simulations (GEOS-4)





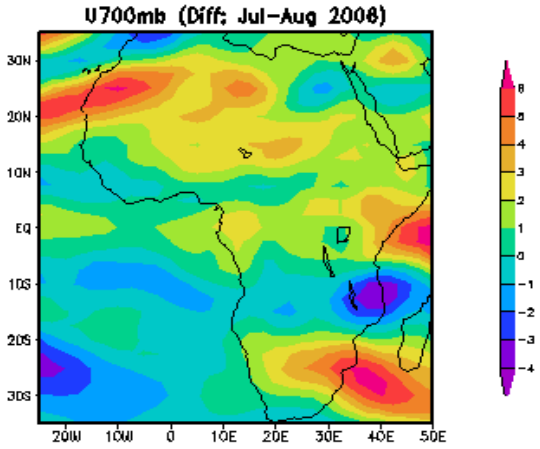


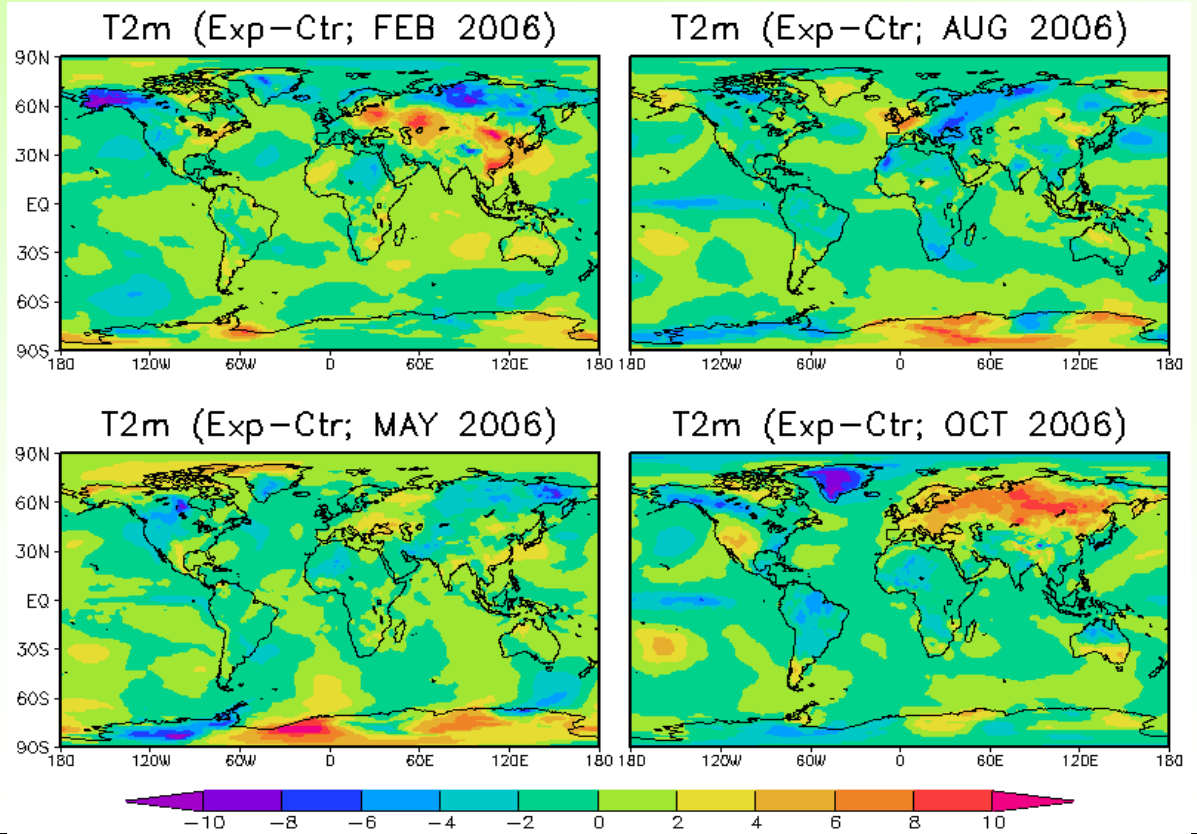
- **Li**
  - understanding dust accumulations over Antarctica



session 3 IMPACT

- **Lu**
  - assessing the impact of aerosol on climate using the NCEP CFS

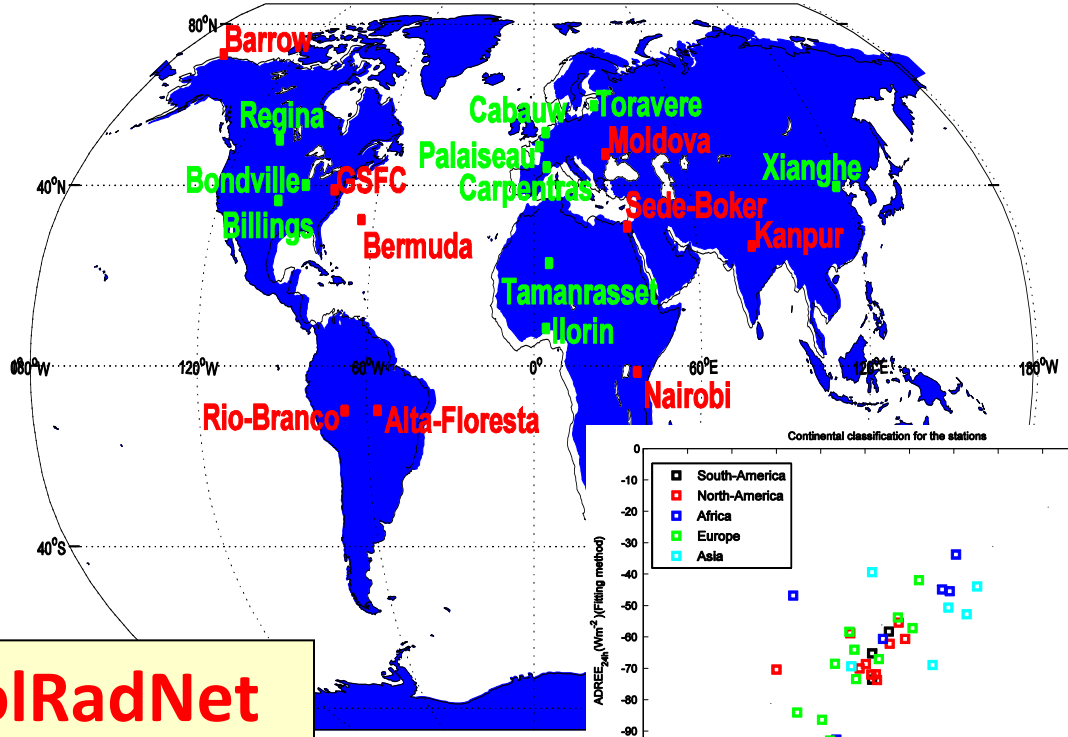


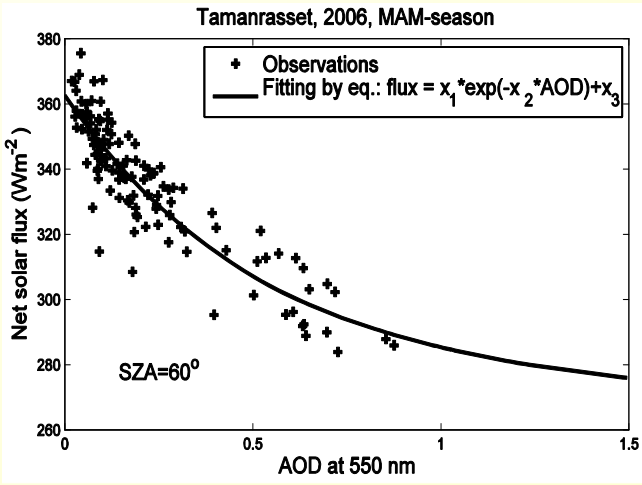


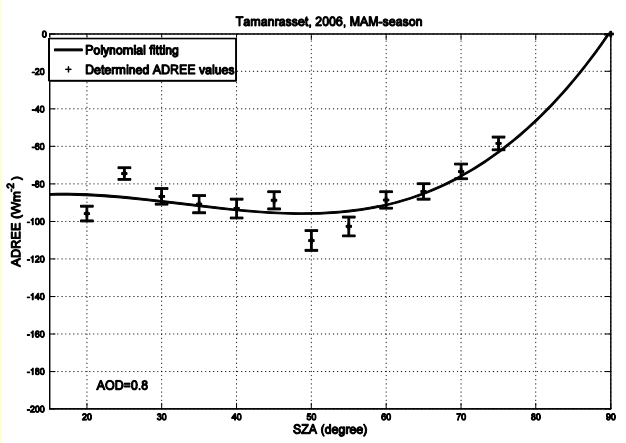
- NCEP CFS (GFS coupled with MOM3) CMIP experiments using different aerosol data sets
- Aerosols are found to alter the atmospheric circulation through their direct radiative forcing

session 3 IMPACT

- **Myhre**
  - aerosol direct net radiative forcing efficiency at the surface







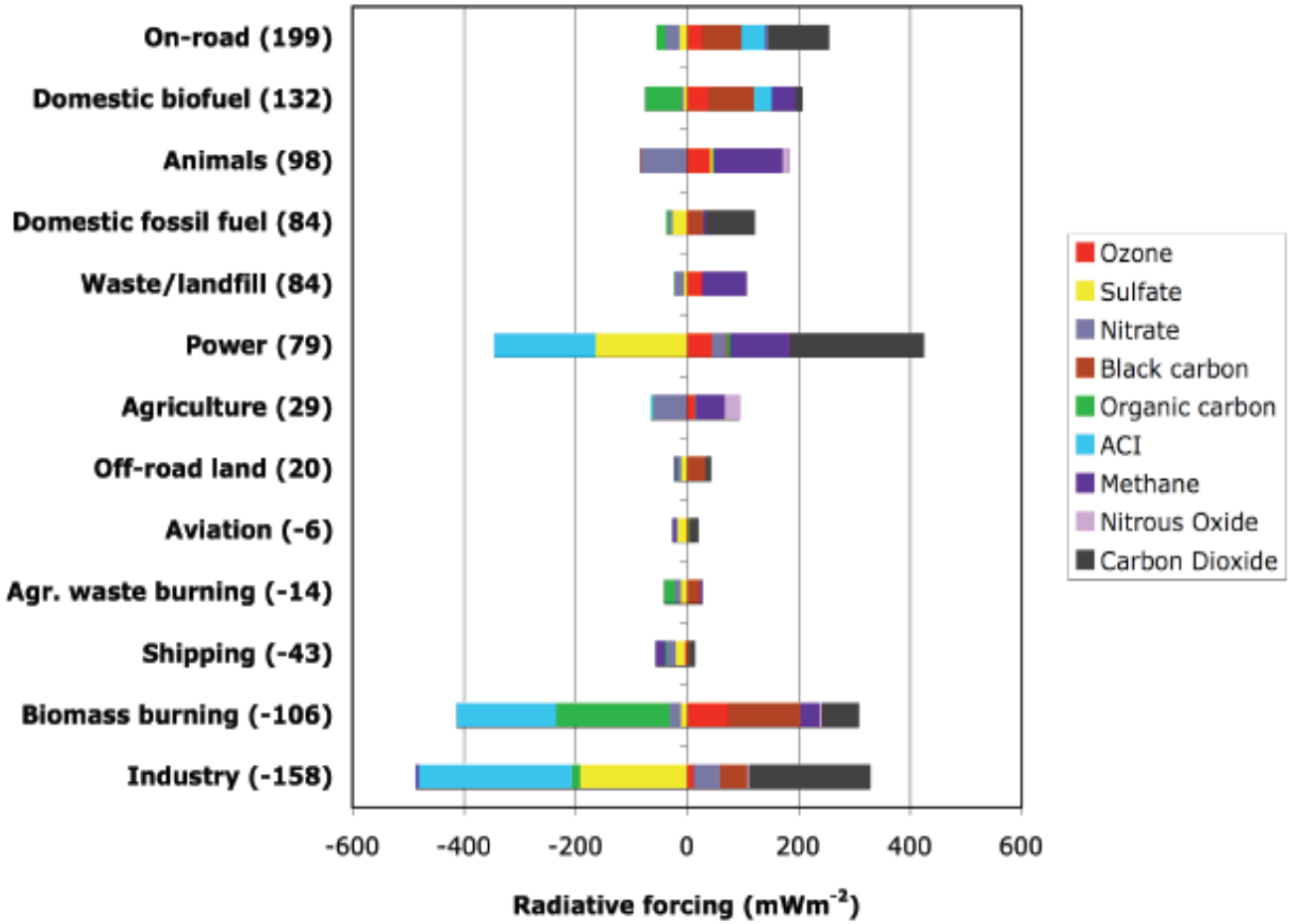
SolRadNet

BSRN

session 3 IMPACT

- Unger
  - attribution of climate forcing to economic sectors

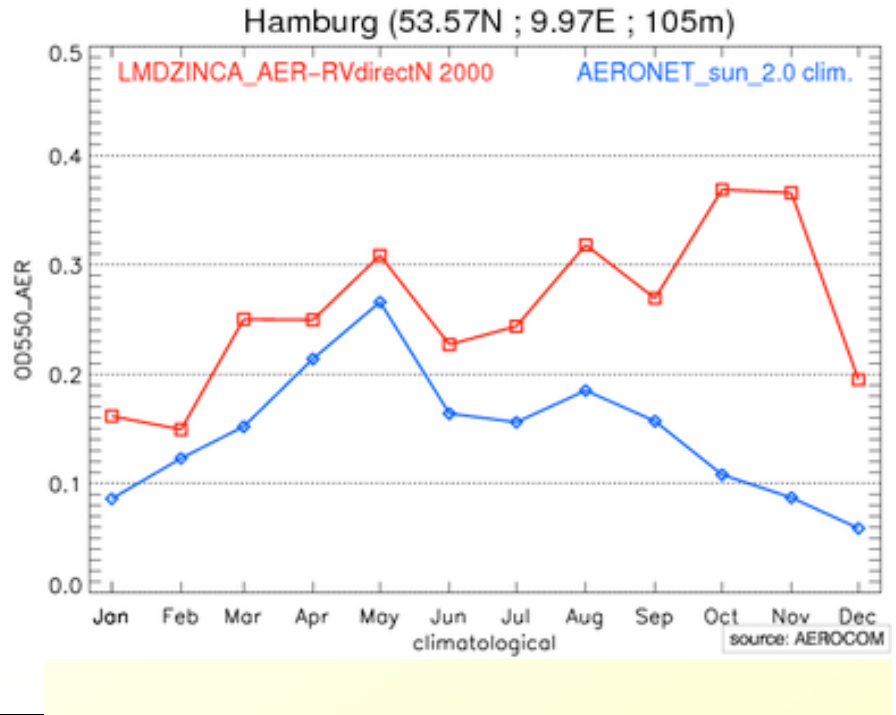
climate impacts at 2020 of human-made pollution from current emissions grouped by economic sector



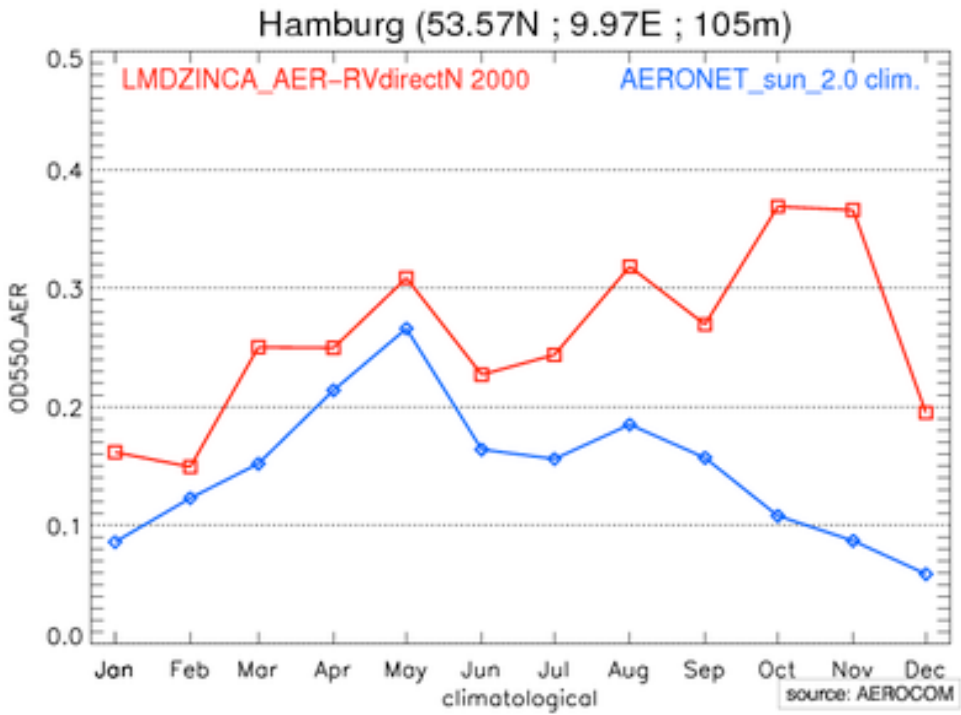
session 3 IMPACT

- **Vuolo**
  - evaluation of aerosol radiative forcing with the LMDZ-INCA

AOD at 550nm



TOA SW CS Flux



session 3 IMPACT

- **Yuan**
  - impact of aerosol on NOx production by lightning