posters

1 min of fame

line-up (alphabetic)

- Bergmann
- Bian
- Chin
- Chung
- Holzer-Popp
- Janssens-Maenhout
- Jin
- Kang
- Kim
- Kinne
- Kirkevag
- Kokkula

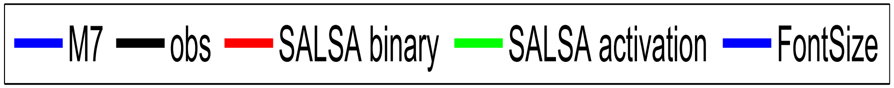
- Lee
- Matsui
- Nishizawa
- Omar
- Pappalardo
- Pozzoli
- Pringle
- Sekiyama
- Tanaka
- Takahashi
- Woodhouse

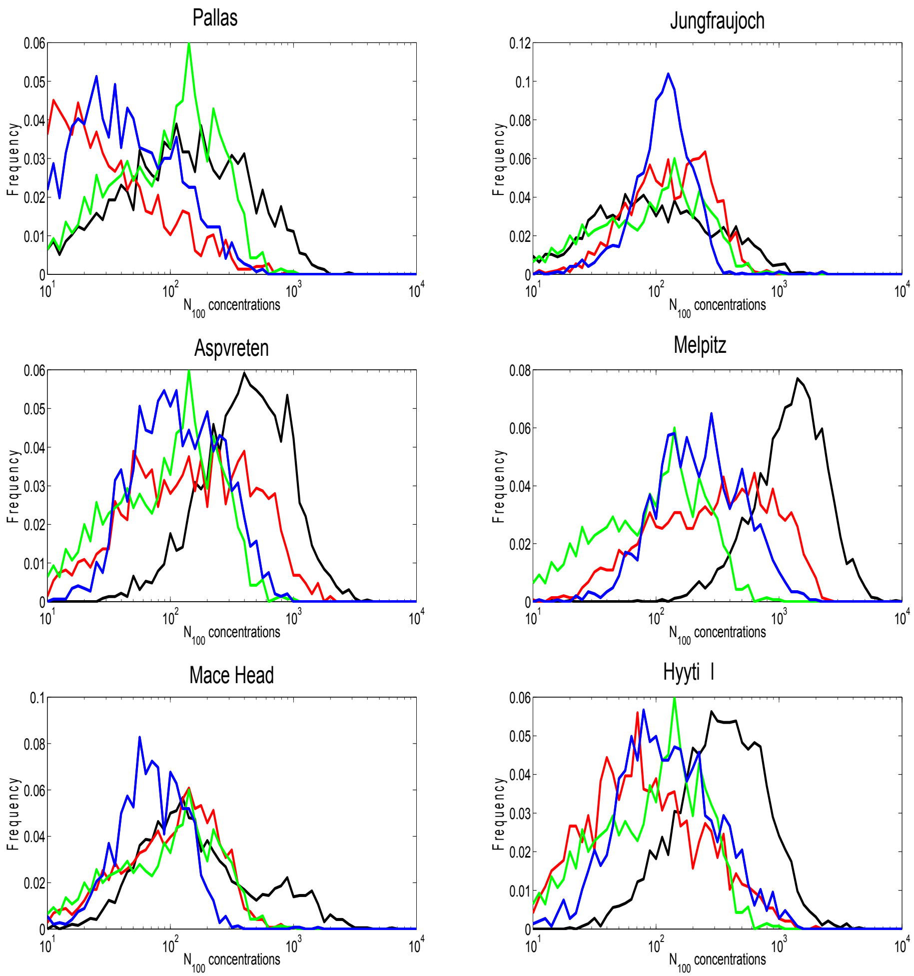
number concentrations modeled with ECHAM5-HAM using SALSA and M7

comparisons to observations

T.Bergman et al.

- **using concentration histograms instead of size distributions for comparison**



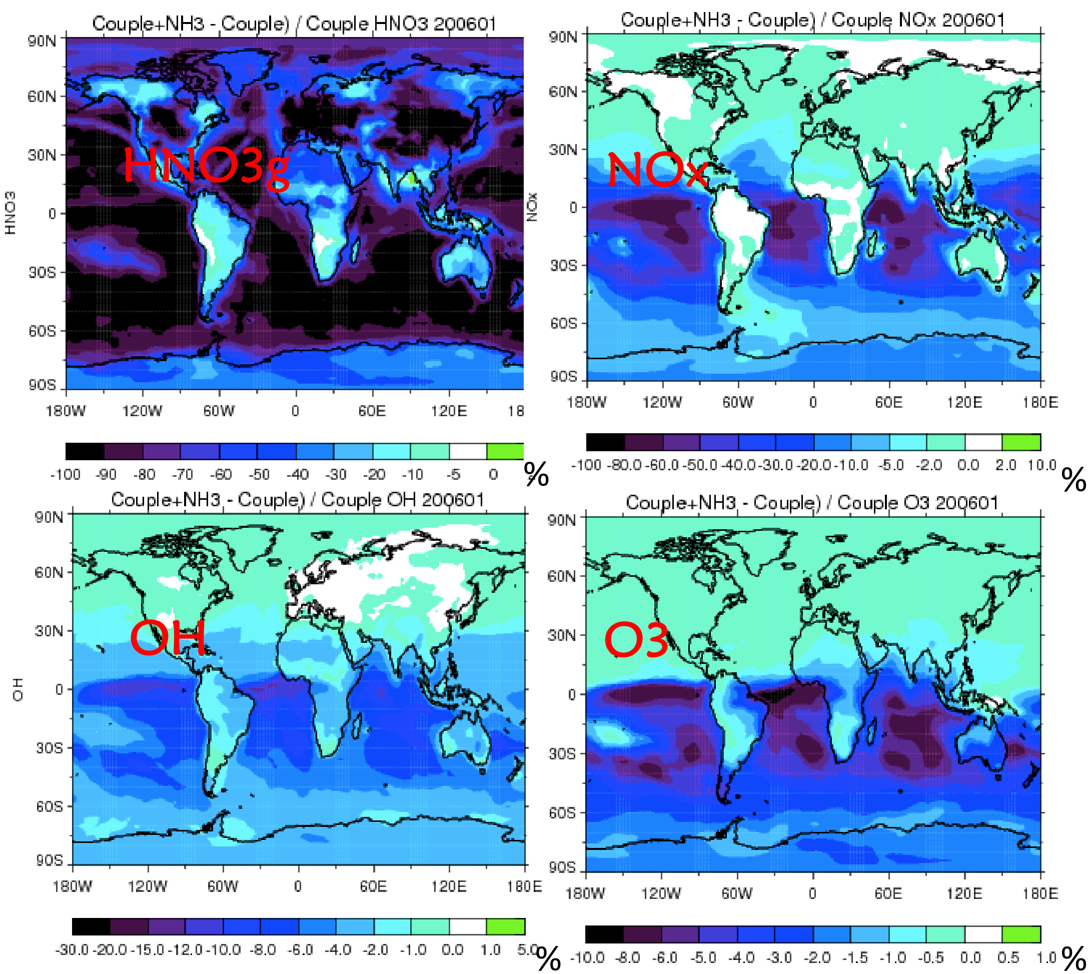


Investigation of atmospheric **nitrate and ammonium** and their impact on chemistry fields

Huisheng Bian [1,2], Steve Steenrod[1,2], Mian Chin[2], and Jose Rodriguez[2]

[1]GEST/University of Maryland at Baltimore County, [2]GSFC/NASA

Relative changes of O3 and its precursors in January

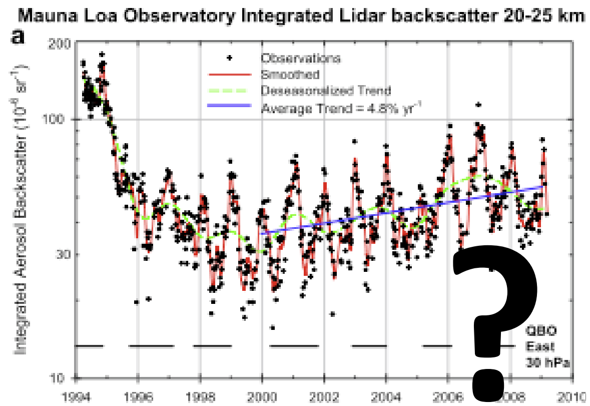


1. HNO3g decreased globally
2. Decreased HNO3g drove global NOx and OH reduction through decreasing its photodissociation
3. The average global O3 change was less than 2%

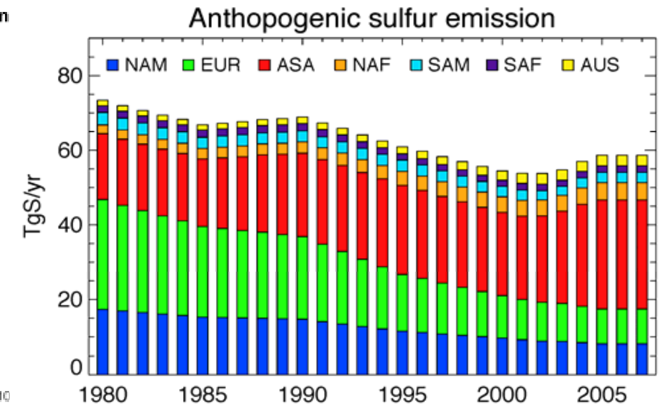
Anthropogenic and volcanic contributions to the stratospheric aerosols

M.Chin, Q.Tan, T.Diehl, N.Krotkov, JP. Vernier, W. Read, D.Streets

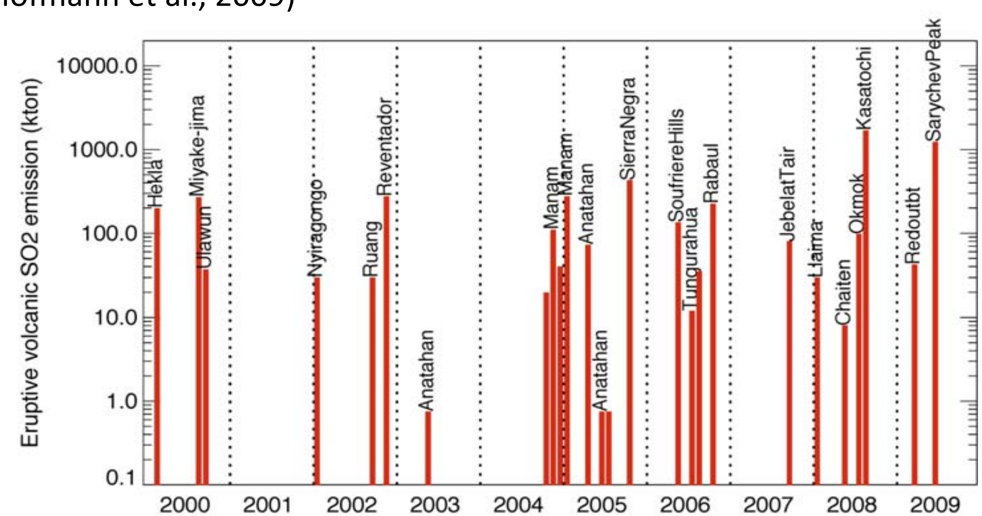
- **Stratospheric aerosols seems to be increasing in the past decade**
- **Hofmann et al. (2009) suggested that it is probably due to the increase of Asian pollutions**
- **However volcanic emissions may also be the cause of this increasing due to their emission height that is close to or in the stratosphere**
- **We attempt to use the GOCART model to separate volcanic and Asian anthropogenic influences in the stratospheric aerosol trends**
- **Come to my poster to see what we get!**



Lidar backscatter of 20-25 km aerosols over Hawaii (Hofmann et al., 2009)



Anthropogenic SO2 emissions, 1980-2007



Volcanic SO2 emissions above 10 km, 2000 to 2008 (based on OMI volcanic emission estimate, compiled by Thomas Diehl)

Observationally constrained estimates for global and regional BC and OM radiative forcing

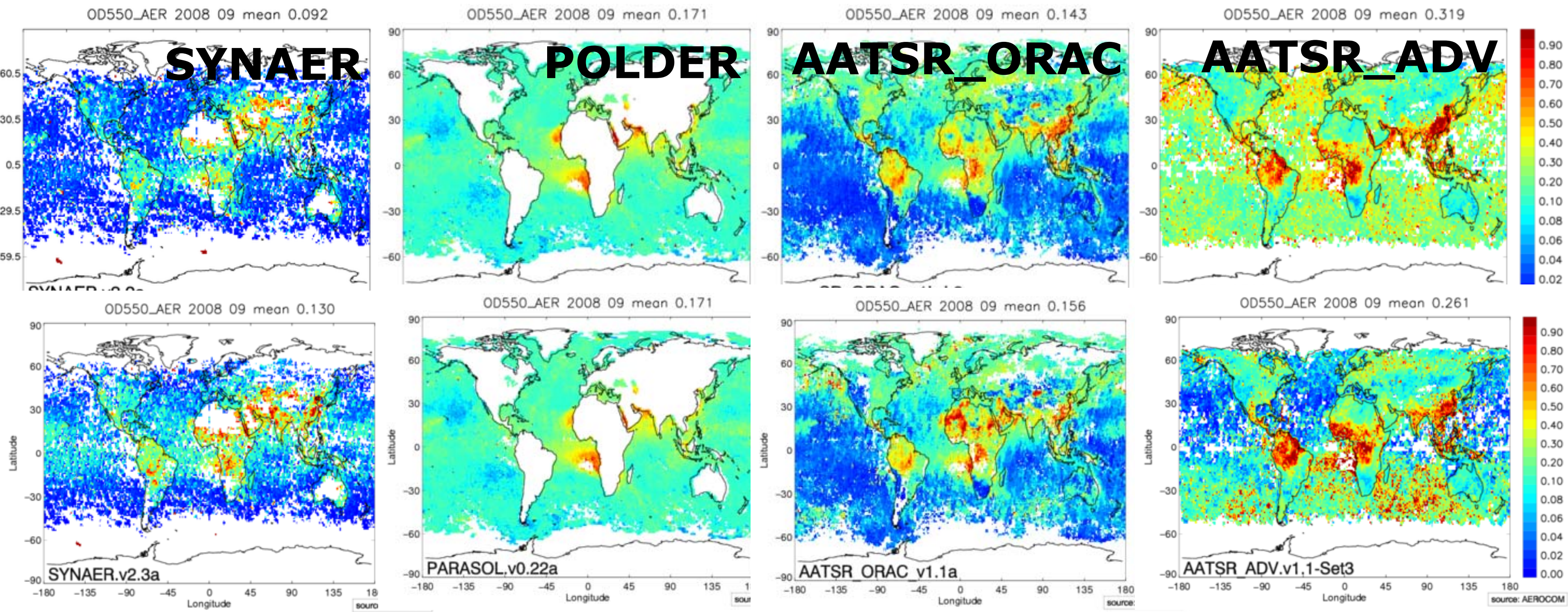
- **Chul E. Chung**1, V. Ramanathan2 and Damien Decremer1

[1] {Gwangju Institute of Science and Technology, Korea}

[2] {Scripps Institution of Oceanography, La Jolla, Ca, USA}

evaluations in aerosol_cci

Holzer-Popp et al.



7 retrievals: 3 AATSR, 2 MERIS, SYNAER, PARASOL

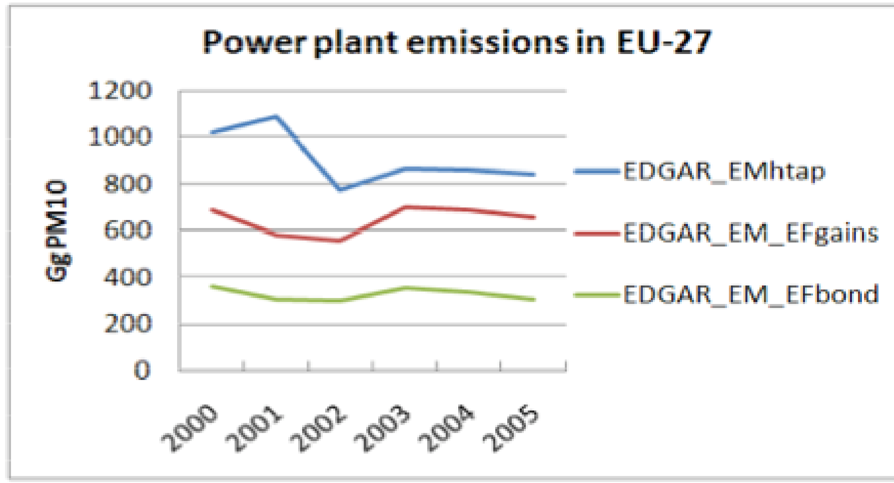
- common aerosol properties and cloud mask
- analysis vs. AERONET / September 2008 gridded 1 degree
- assessment of other aerosol properties
- AeroCom tools and requirements

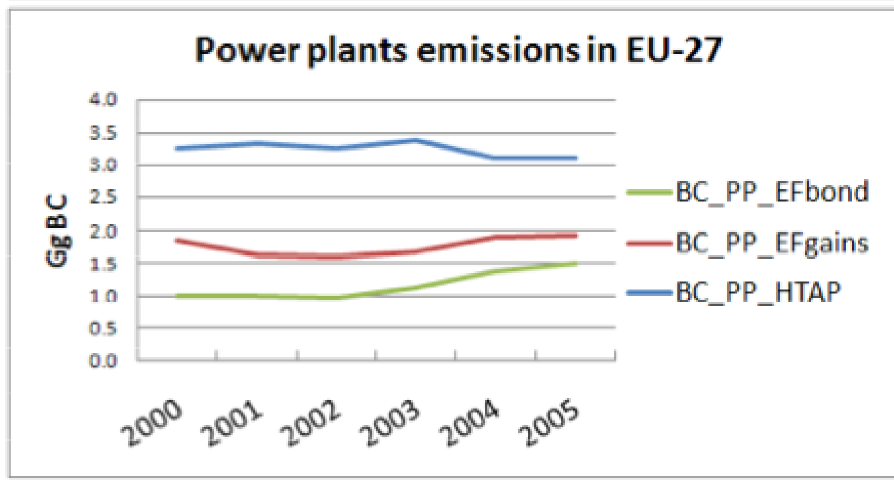
comparing aerosol emission estimates using different approaches and emission factor datasets in EDGAR

G. Janssens-Maenhout, M. Muntean, A.Hjadu, J. Olivier, R. Petrescu, V. Pagilari, F. Dentener, J.Wilson, E. Vignati

Derivation of EC emission inventories combining source profiles with
1. particulate matter (PM) emission factor and sector- specific mass fractions for EC
2. technology-specific combustion models to that directly estimate EC emission factors.

The resulting gridmaps using Bond approach for USA and GAINS approach for Europe and China were assessed for different sectors by comparing these with the EDGAR-HTAP patchwork of officially accepted EC emission inventories.





OC emissions from HTAP/ GAINS/ Bond differ a factor 10.

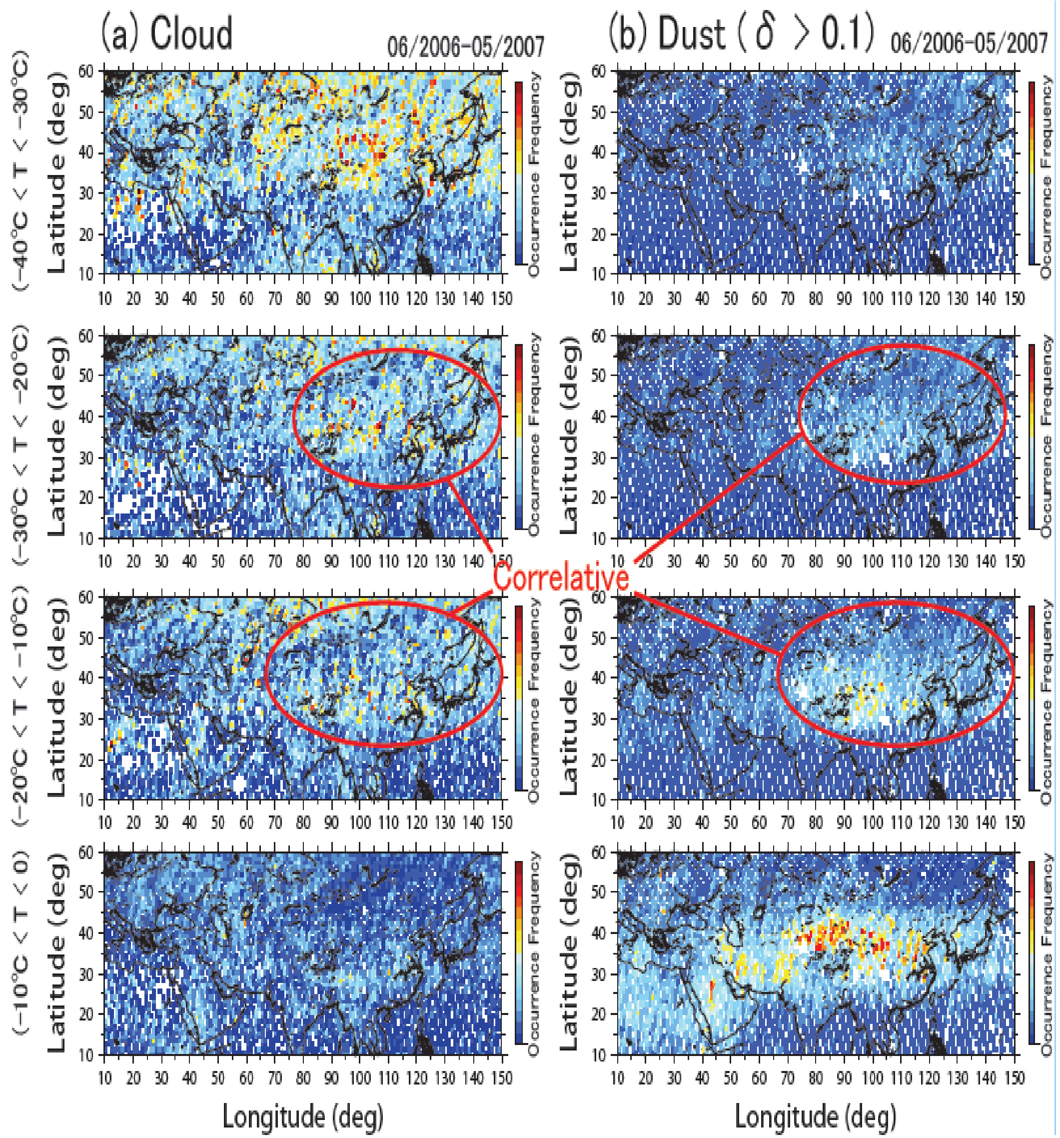
spatial distribution of the aerosol acting as ice nuclei over northwest China

Y.Jin et al

Occerrence frequency of the cloud and dust for each temperature ranges and object regions. The dust is defined as the volume depolarization ratio is over 0.1.

For the highest temperature range (−10℃ < T < 0), there is no correlation between cloud and dust spatial distributions.

However, for the lower ranges (T < −10℃), there is correlation between them.

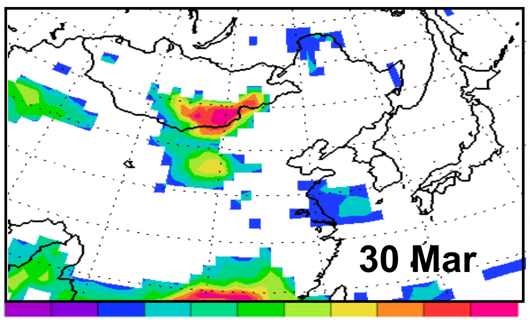


simulation of Asian dust with 3 emission schemes

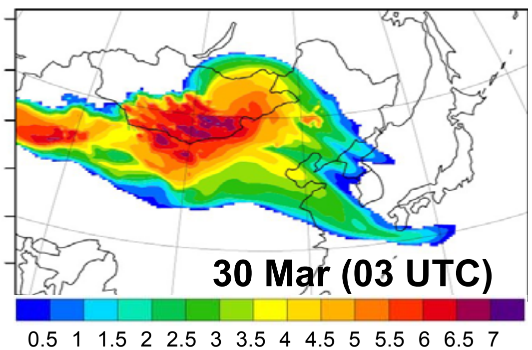
J-Y. Kang[1], M.Mikami[1], Y.Shao[2], S-C.Yoon[3], T.Tanaka[1], T.Sekiyama[1]

[1]Meteorological Research Institute, Japan; [2]University of Cologne, Germany; [3]Seoul National University, Korea

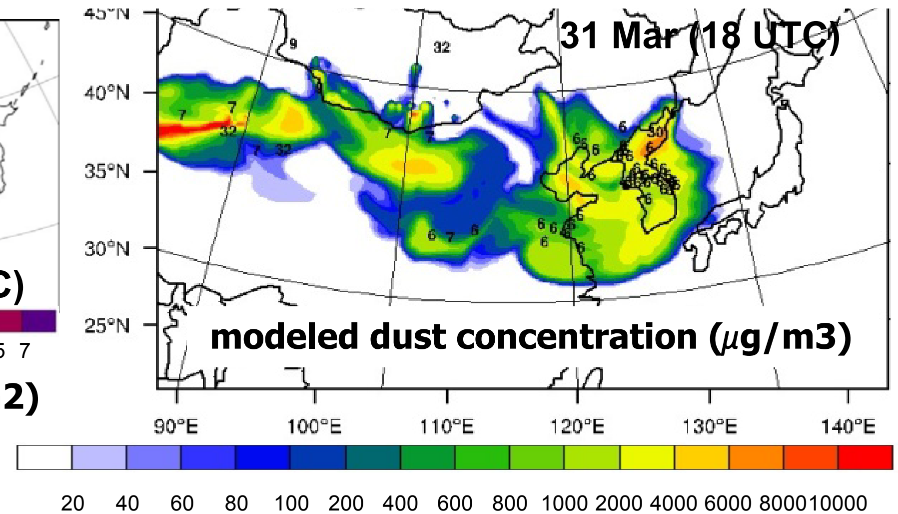
- **3 dust emission parameterizations, MB (Marticorena & Bergametti, 1995), LS (Lu & Shao, 1999) and S04 (Shao, 2004) are implemented in WRF/Chem and a case study is carried out for a dust event that occurred on March 31 –April 1, 2007.**



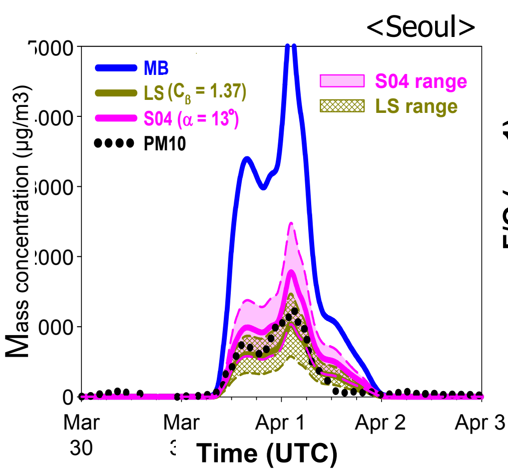
OMI Aerosol Index



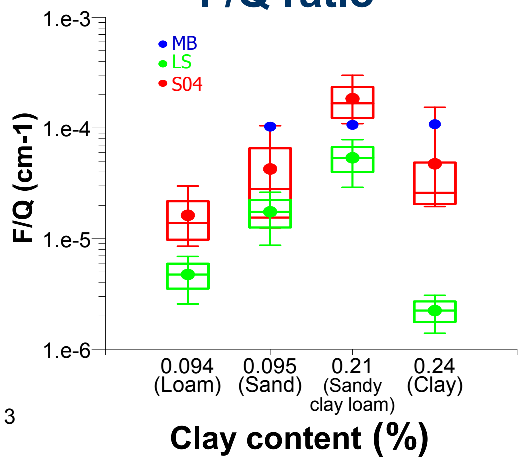
modeled dust load (μg/m2)



dust concentr.



F/Q ratio



- The spatial distributions of model results are well matched with observation.
- The MB scheme shows the highest dust amounts because it generates higher F than other schemes under the same Q condition.
- The MB scheme assumes the capacity to provide dust is controlled by clay content. Fine particles are usually form an aggregate, so the binding energy should be considered.

Comparison of light-absorbing aerosol properties observed in East and South Asia

Sang-Woo Kim
School of Earth and Environmental Sciences, Seoul National University, Korea

S.Kinne et al.

+ 0.3W/m2

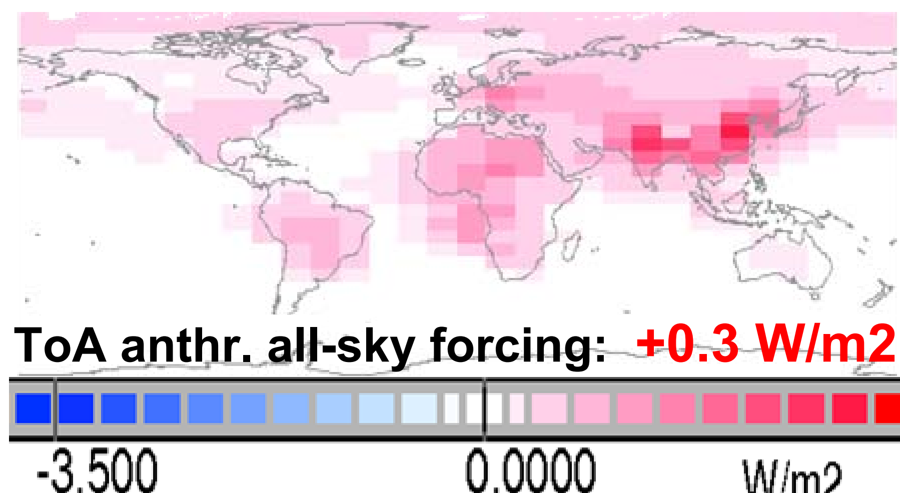
radiative forcing by black carbon

AERONET knows about BC AOD

- at ca. 400 sites worldwide
- sky data → AOD, size-dis, RF
- extract AOD of BC component
  - ignore super-micron sizes
  - apply MIE → fine abs-AOD
  - fine absAOD = BC absAOD
  - BC -size, -RF → BC-ω = .35
  - BC AOD = BC absAOD/ .65
- compare to BC-AOD of models
- → find deficiencies in modeling
- → estimate BC radiative forcing

combine local high quality AERONET data with spatial distribution by gl. modeling

- modeling underesti. BC abs
  - factor 6 ! S.Asia fall/winter
  - factor 3 E.Asia fall/winter



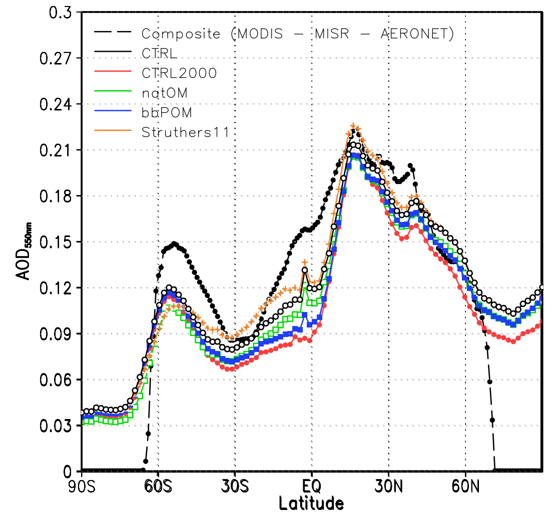
ToA anthr. all-sky forcing: +0.3 W/m2

solar atm absorption: +0.8W/m2

Aerosols and their direct & indirect effects in CAM4-Oslo

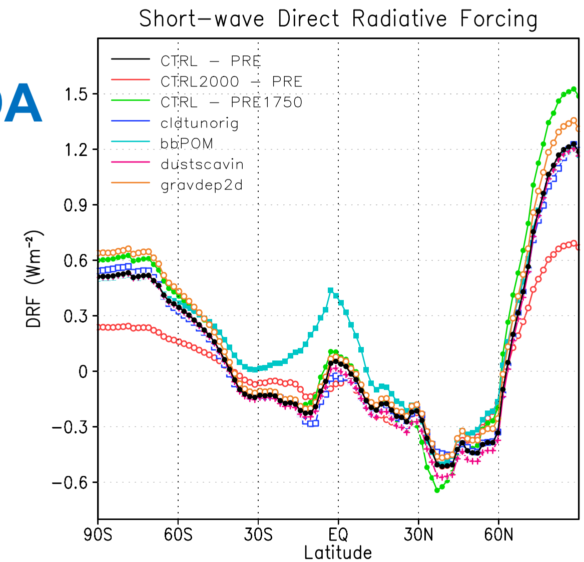
On the importance of natural aerosols for estimates of AOD and anthropogenic impacts

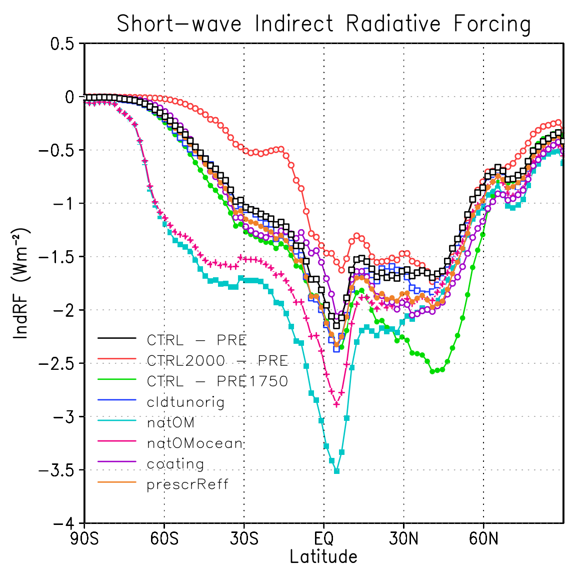
Alf Kirkevåg, Trond Iversen, Øyvind Seland, Hamish Struthers, Corinna Hoose, and Steve Ghan



Clear-sky AOD

DRF at TOA





InDRF at TOA

Improving the accuracy of sectional aerosol microphysics models of coarse size resolution

Harri Kokkola[A], Arto Voutilainen[B], Elina Madetoja[B], Tapani Korhola[B], Tommi Bergman[A], Sami Romakkaniemi[B]

- Sectional method computationally demanding
=> Coarse size resolution has to be used
=> Numerical error

Moving center method
- empty bins
Semi-moving
- no empty bins
- very little amount of numerical error

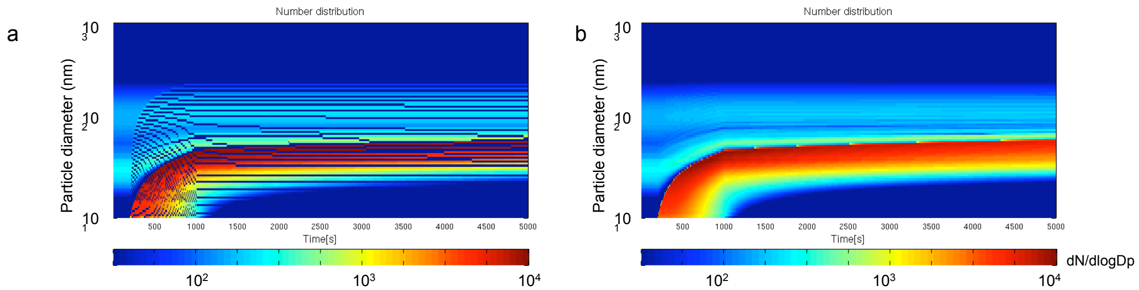
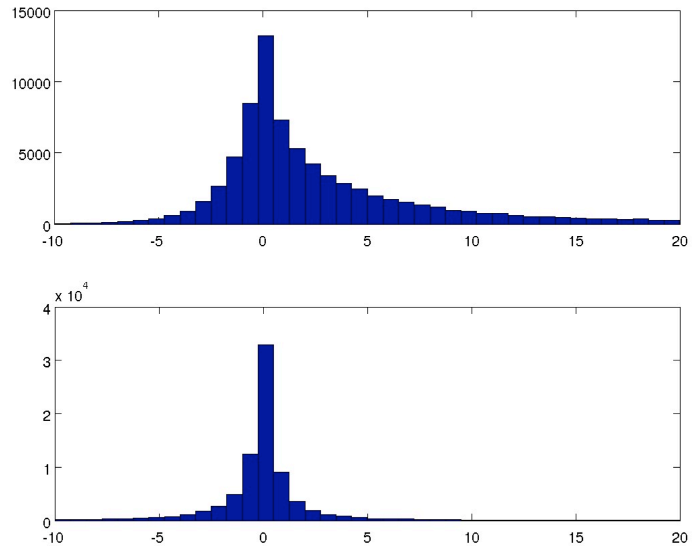


Figure 2: Simulated nucleation event

Smoothed distribution function
- Fast algorithm
- Fitted for coarse bins
- Example: cloud activation
  - reduces relative error significantly
  - especially the occurrence of large relative errors is reduced



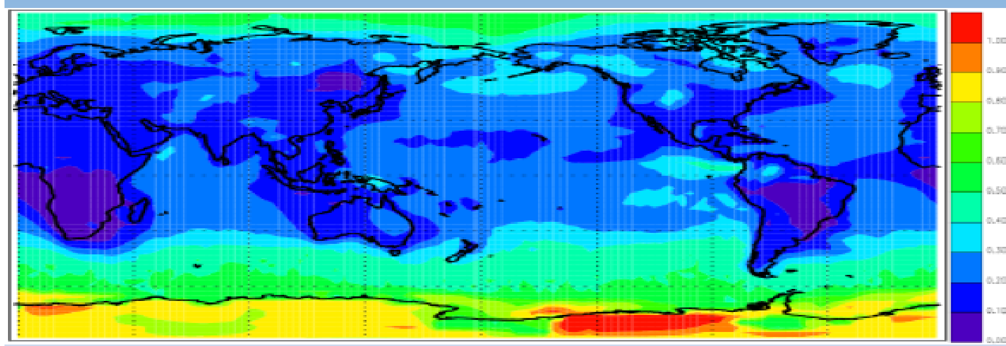
Emulation of a global aerosol model to quantify model sensitivity to uncertain parameters

Lindsay Lee, Ken Carslaw, Kirsty Pringle, Graham Mann, Dominick Spracklen

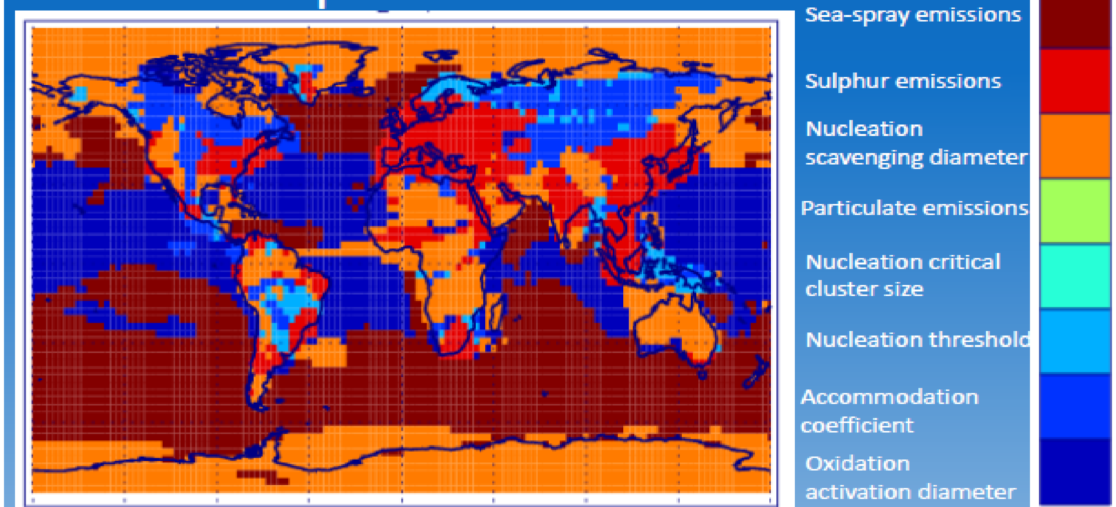
NATURAL ENVIRONMENT RESEARCH COUNCIL (University of Leeds) *Contact: l.a.lee@leeds.ac.uk* National Centre for Atmospheric Science

- Parameter uncertainty is a key uncertainty in aerosol-climate simulations
- 80 GLOMAP-mode simulations carried out with uncertain parameters perturbed based on Latin hypercube sampling
- Use emulation software to fill parameter space & quantify & attribute CCN uncertainty to parameters

σ_X /CCN – the uncertainty in CCN relative to the estimated CCN.



Dominant parameter sensitivities



impact of new particle formation on the concentrations of aerosols and cloud condensation nuclei around Beijing

H. Matsui,[1] M.Koike,[1] Y.Kondo,[1] N.Takegawa,[1] A.Wiedensohler,[2] J.D.Fast,[3] and R.A.Zaveri[3]

1. Univ. of Tokyo; 2. IfT, Germany; 3. PNNL, USA

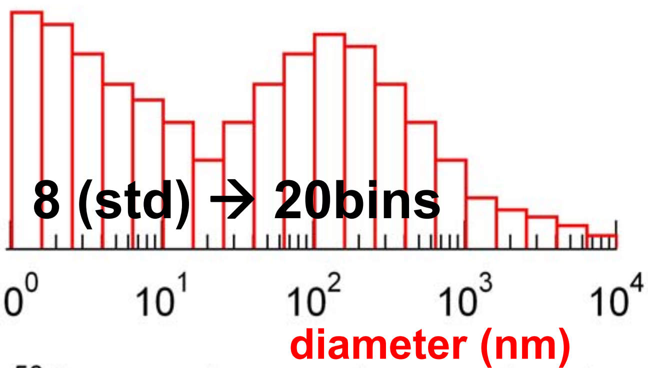
10th AeroCom Workshop
2011/10/3 - 10/6

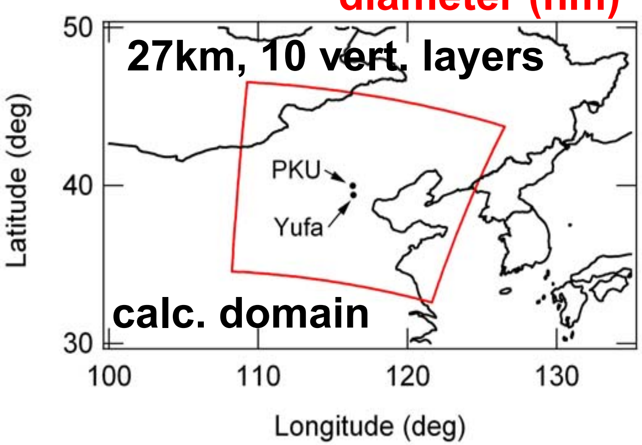
binary homog. nucleation (BHN)

[*Wexler et al.*,1994] … for free troposphere

J* (cm-3 s-1) = A x [H2SO4]

[Kumula 2006] … for plan. boundary layer





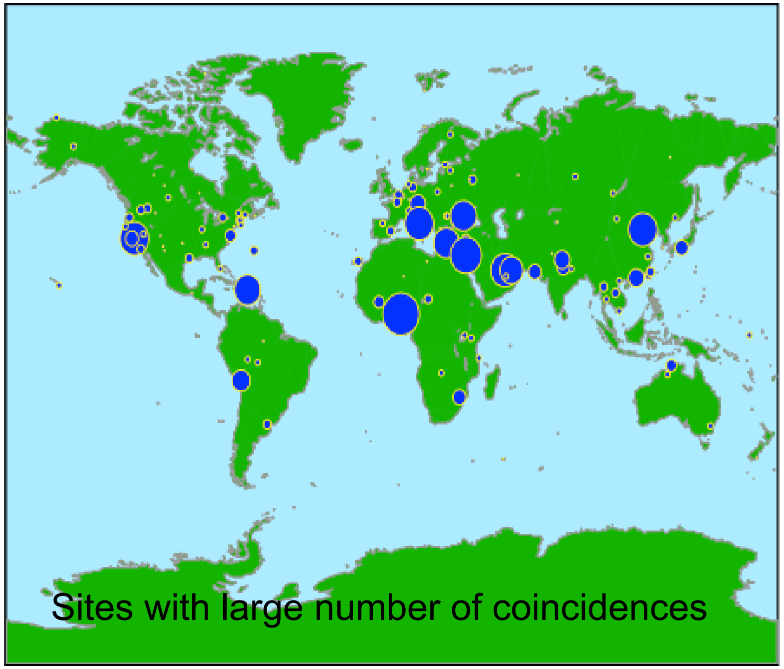
- Development of NPF-explicit version of WRF-chem model.
- Validation of NPF calculations using in-situ measurements.
- To understand the impact of NPF on CN and CCN around Beijing.
- To understand the sensitivity of CN and CCN to primary emissions.

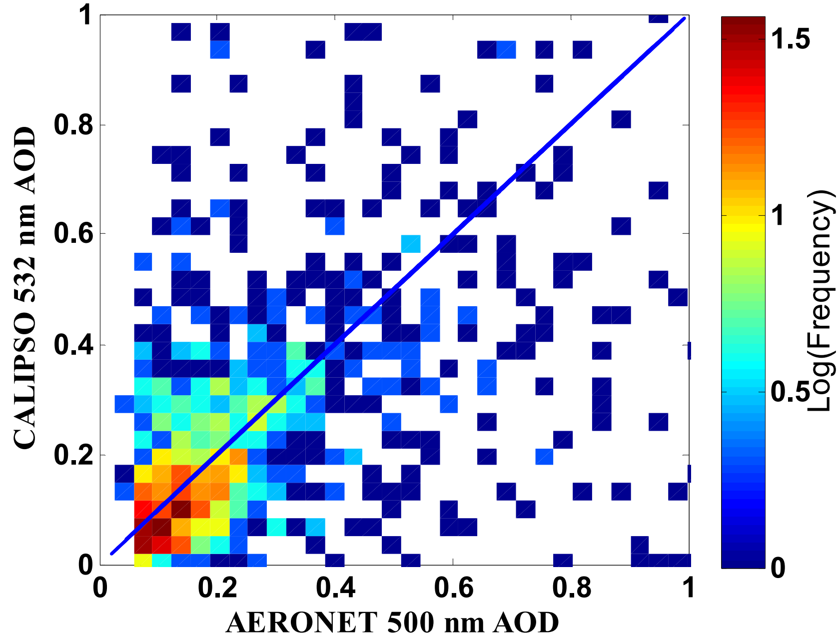
Development of two-wavelength high-spectral resolution lidar (HSRL) for the next-generation aerosol-monitoring lidar network

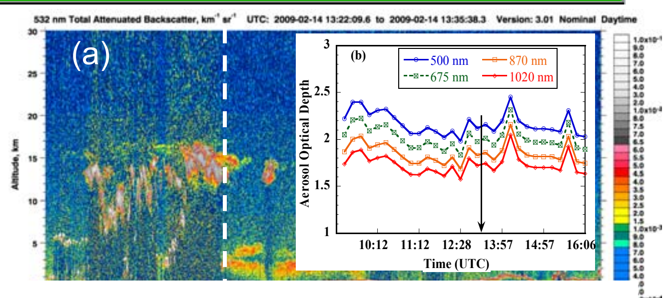
Tomoaki Nishizawa, Nobuo Sugimoto,
and Ichiro Matsui
(National Institute for Environmental Studies, NIES, Japan)

A 2α+3β+2δ HSRL was developed. Design of the lidar and results of preliminary measurements are presented.

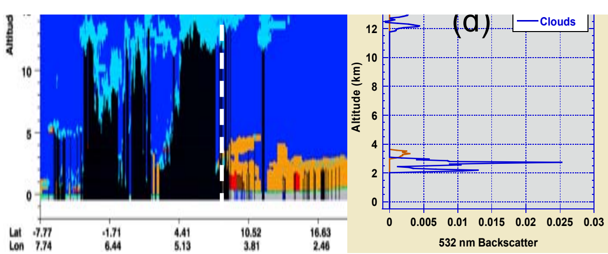
CALIPSO AERONET OPTICAL DEPTH COMPARISONS: ONE SIZE FITS NONE

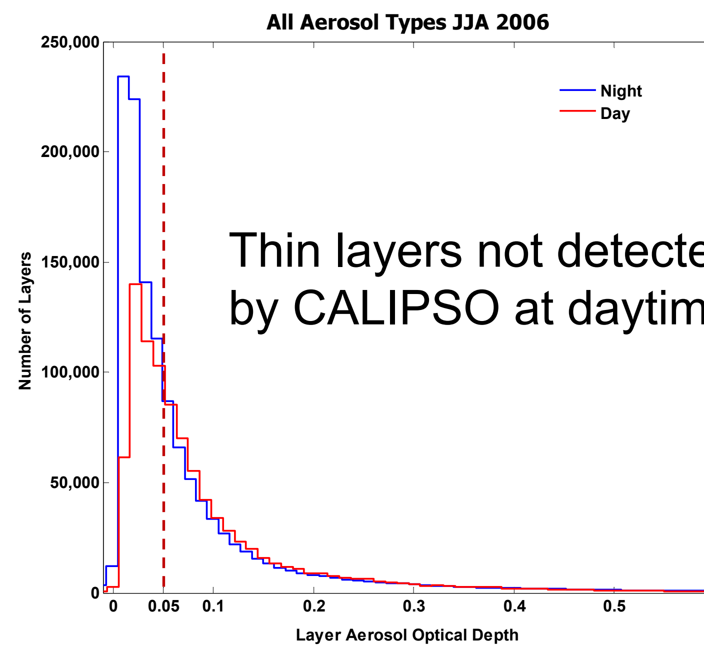






Differences in CALIPSO AERONET Cloud Mask





OMAR et al.

ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure Network) is a European Project aiming at integrating European ground-based stations equipped with advanced atmospheric probing instrumentation for aerosols, clouds, and short-lived gas-phase species.

ACTRIS is building the next generation of the ground-based component of the EU observing system by integrating three existing research infrastructures EUSAAR, EARLINET, CLOUDNET, and a new trace gas network component into a single coordinated framework.

Data are accessible through the ACTRIS data center which in addition provides tools and applications for end users to facilitate the use of all measurements for broad user communities.

www.actris.net

*Gelsomina **Pappalardo**, pappalardo@imaa.cnr.it*

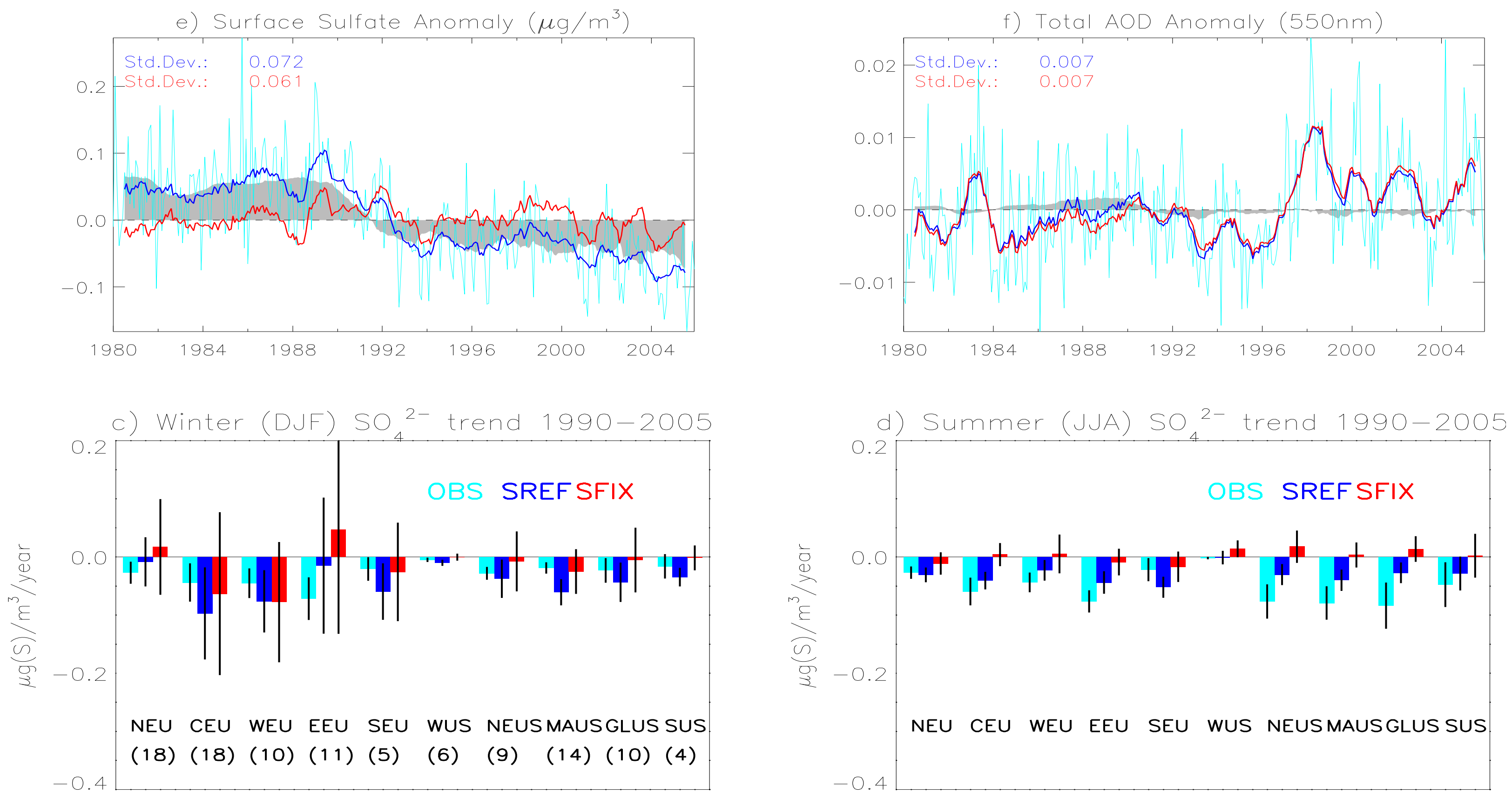
Re-analysis of tropospheric aerosols for the period 1980-2005 using ECHAM5-HAMMOZ

L.Pozzoli, G.Maenhout, T.Diehl, I.Bey, M.G.Schultz, J.Feichter, E.Vignati, and F.Dentener

- **AeroCom simulations for the period 1980–2005**
- **Separation of the impact of the anthropogenic emissions and natural variability on atmospheric chemistry**

1.SREF: changing anthrop. emissions

2.SFIX: fixed anthropogenic emissions (year 1980)

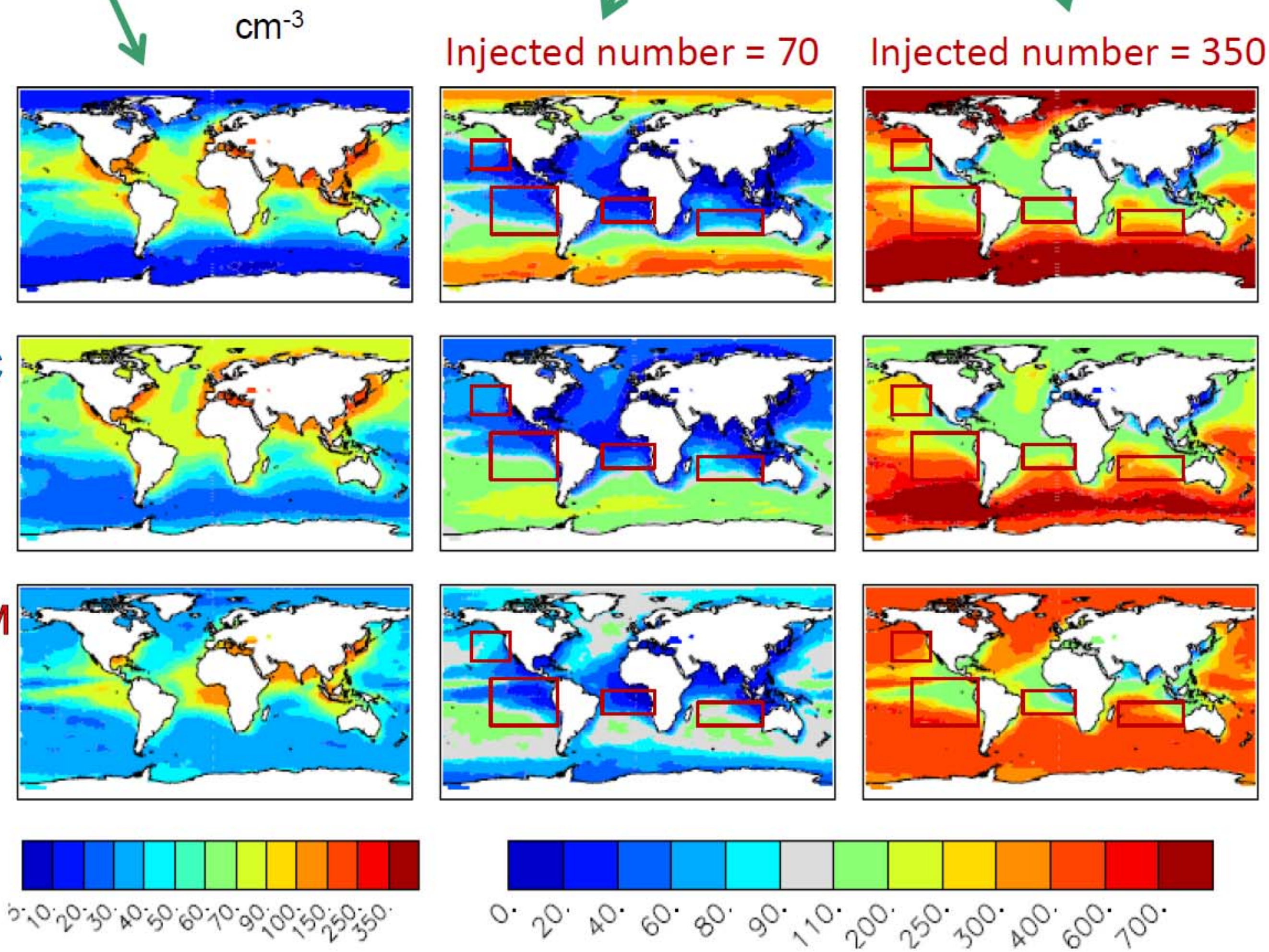


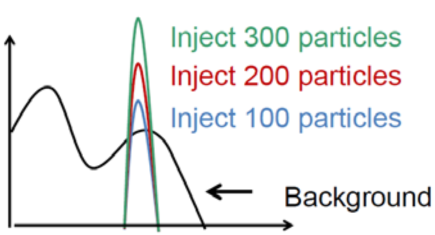
Sea spray geo-engineering: a multi-model assessment

Kirsty Pringle[1], Ken Carslaw[1], Tingting Fan[1], Graham Mann[1], Kai Zhang[2], Adrian Hill[3]
(1:University of Leeds, Leeds, U.K.), (2:MPI-Meteorology, Hamburg, Germany) (3:UK Met Office, Exeter, U.K.)

Use AEROCOM all-aerosol tracer data for 3 models to construct size distributions.

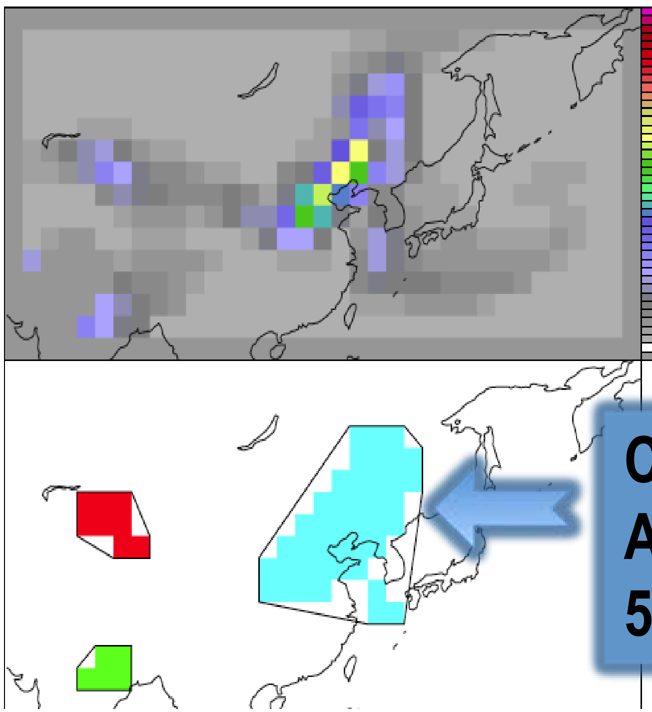
Use Nenes & Seinfeld (2003) parameterization to calculate CDN concn



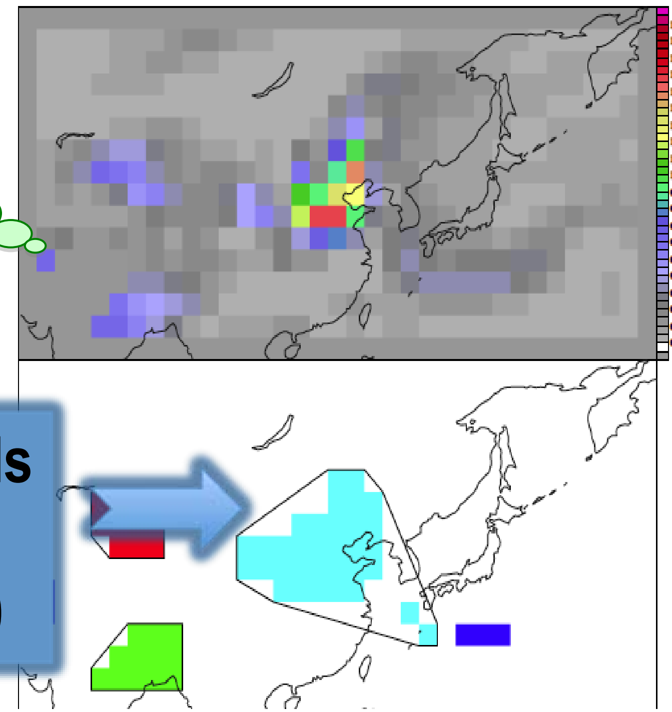


Object-based Verification of Aerosol Simulations

Observation



Data Assimilation Result



How good or bad?

Cent. Dist = 2.10 grds
Area Ratio = 0.83
50% Int. Ratio = 1.00

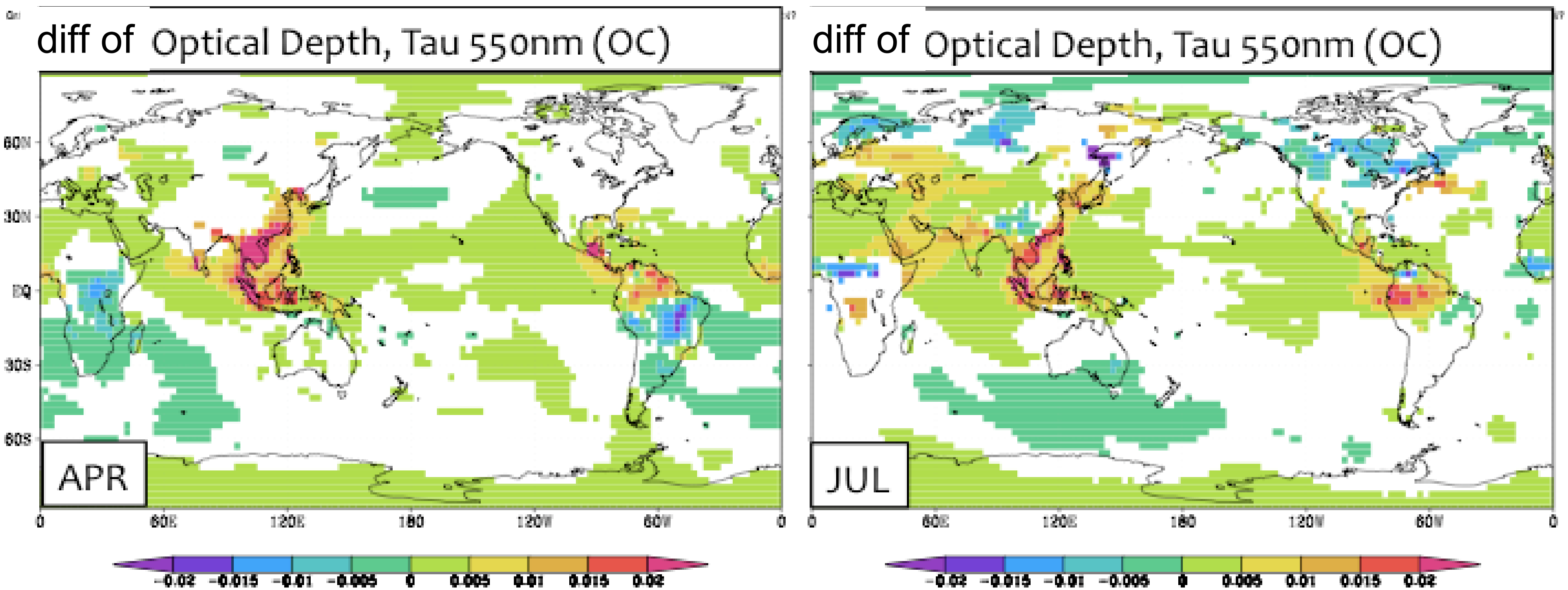
T. T. Sekiyama and T. Y. Tanaka
MRI/JMA, Tsukuba, Japan

Powered by
MET of NCAR

sensitivity study on **impacts of biogenic VOC on Asian monsoon climate** in dry and wet seasons using **MIROC5**

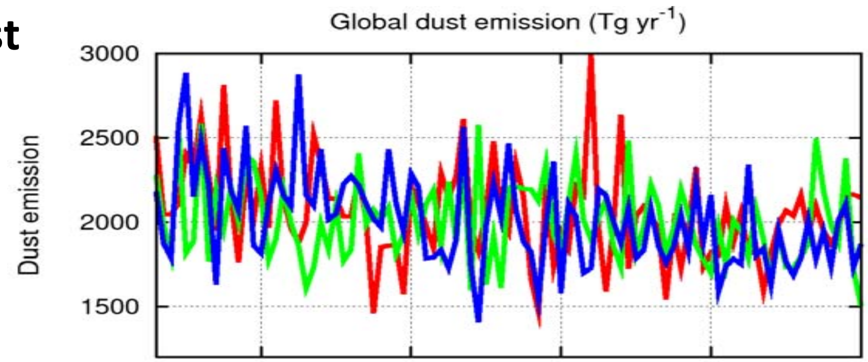
***H.G. Takahashi*(1,2),** H-J. Kim(1), K. Tanaka(1), K. Takata(1), K. Saito(1), and T. Yasunari(1,3) **1. JAMSTEC, 2. Tokyo Metropolitan University, 3. Nagoya University**

- sensitivity experiment of BVOC-SOA
- seasonal difference (dry and wet seasons)

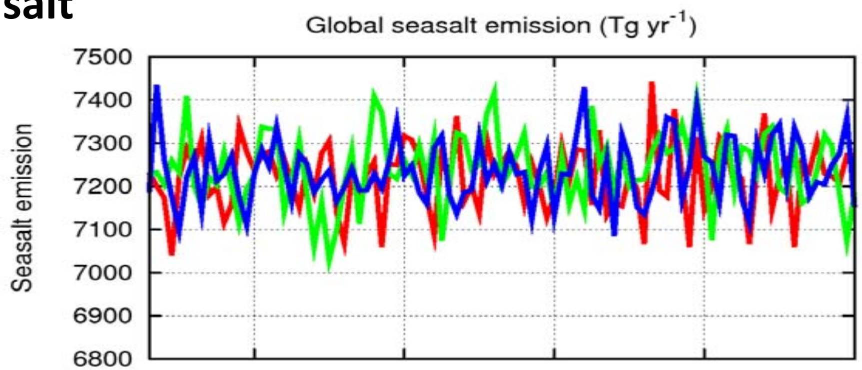


variability of the naturally emitted aerosols in climate CMIP5 experiments of the MRI

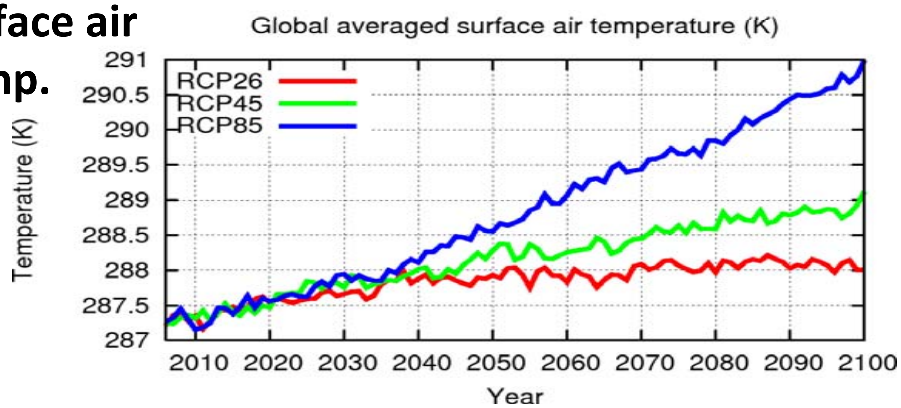
Dust



Sea salt



Surface air Temp.



Taichu Y. Tanaka*,

and MRI Earth System Modeling Group

Meteorological Research Institute,
Japan Meteorological Agency

*Corresponding author, E-mail:

yatanaka@mri-jma.go.jp

- **our climate projection experiments for CMIP5 suggest that for natural aerosol that the future is**

  less dusty and

  more salty

Implementation and evaluation of a microphysical aerosol module in the ECMWF Integrated Forecasting System

Matt Woodhouse (m.woodhouse@see.leeds.ac.uk), Graham Mann, Ken Carslaw (University of Leeds)
Jean-Jacques Morcrette (European Centre for Medium-range Weather Forecasts)
Olivier Boucher (UK Met Office)

- GLOMAP-mode aerosol microphysics scheme implemented into ECMWF-IFS as forward-model for forecasting and data assimilation.
- Evaluation against simpler GEMS aerosol scheme and observations