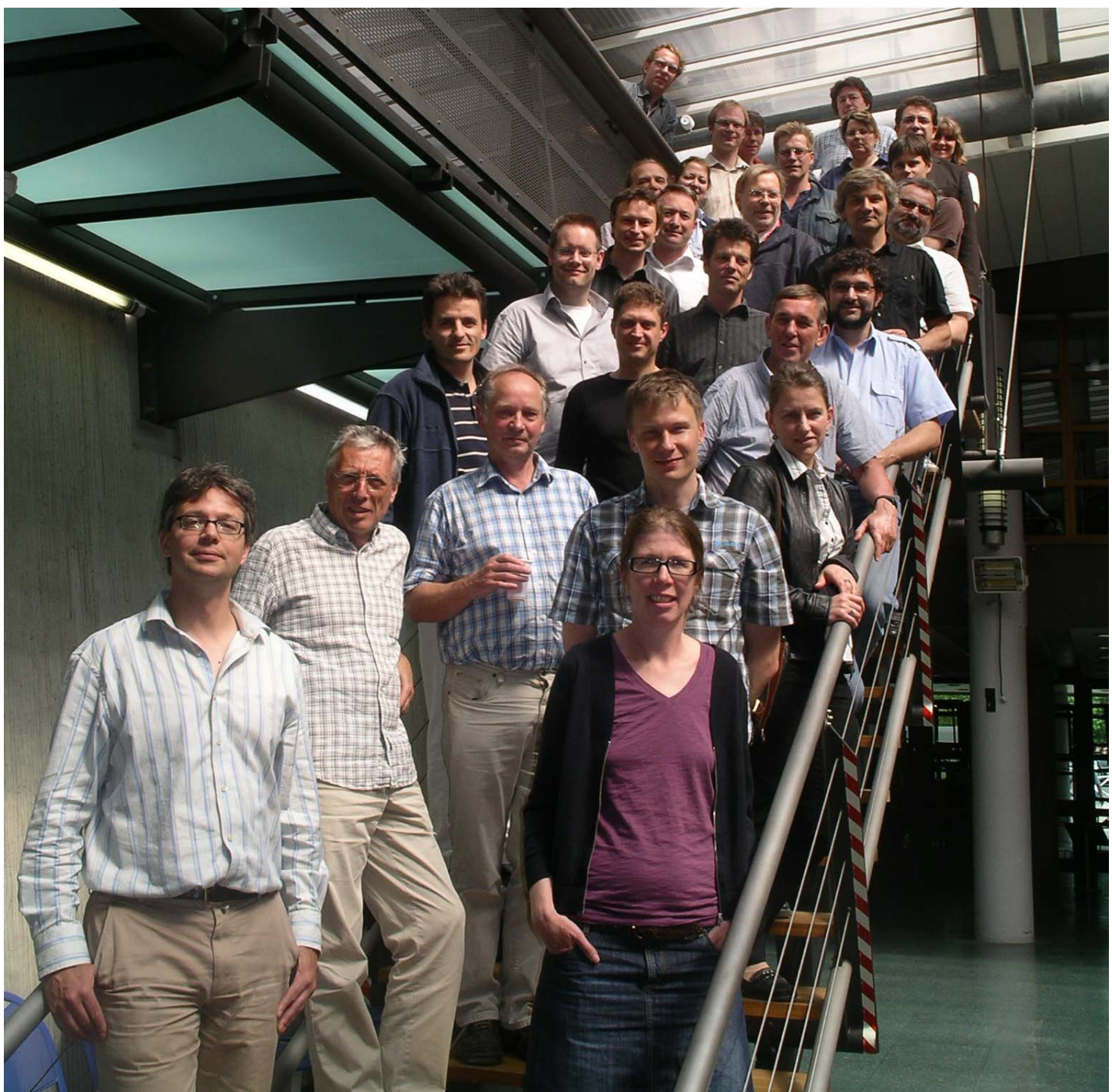




Comparing algorithm versions in aerosol_cci – what can we learn about aerosol properties?

Thomas Holzer-Popp

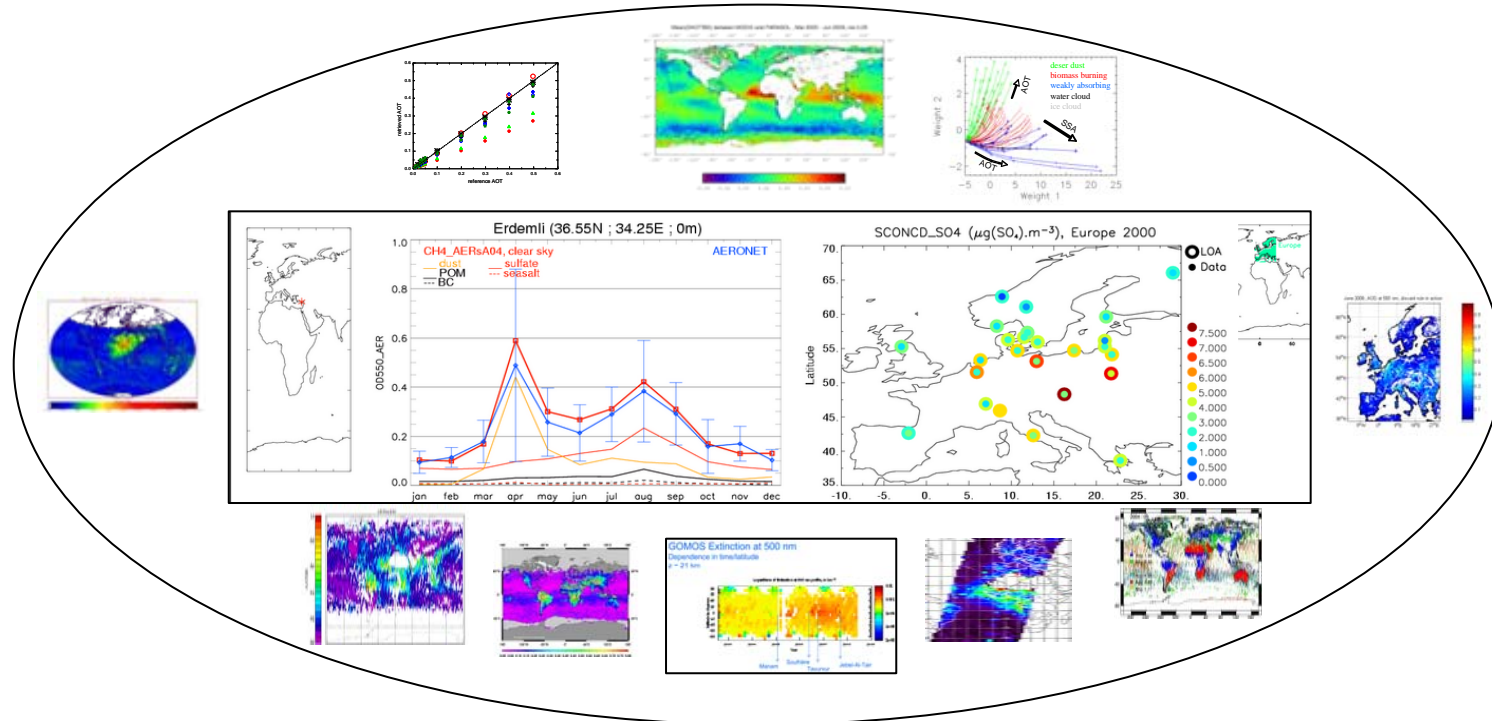
Gerrit de Leeuw, Dmytro Martynenko, Larissa Sogachewa, Pekka Kulmonen, Lars Klüser, Gareth Thomas, Don Grainger, Peter North, Andreas Heckel, Wolfgang von Hoyningen-Hüne, Alexander Kokhanovsky, **Didier Tanre**, Pavel Litvinov, Oleg Doubovik, Pepijn Veefkind, Deborah Stein-Zweers, Stefan Kinne, Michael Schulz, Jan Griesfeller, Richard Siddans, Francois-Marie Breon, Christine Bingen, Charles Robert, Didier Ramon, Kerstin Stebel, Urs Baltensperger, Paul Zieger





understand differences
of various products

integrate major
European EO teams



work with AEROCOM
user community

focus on ENVISAT
and European sensors



- **phase 1 (summer 2011)** analysis of various retrieval versions
 - test dataset global **September 2008**
 - 8 tropospheric algorithms
- **phase 2 (autumn 2011)** round robin
 - dataset global March, June, September, December 2008
 - 8 tropospheric algorithms
- **phase 3 (autumn 2012)**
 - ECV production global all 2008
 - 5 tropospheric algorithms + merged dataset(s)
- validation with established tools in all stages
- evaluation by AEROCOM (MACC)
- further analysis: synthetic case studies, information content analysis

Test datasets (2011)



- **intensive and open exchange of algorithm teams (including external partners)**
- **aerosol properties**
 - define common set of components for all algorithms
 - use for some tests common climatology as prescription or a priori
- **cloud mask**
 - use common cloud mask for morning algorithms
- **surface treatment**
 - use common modules over ocean
 - make individual improvements over land
- **work in progress!**

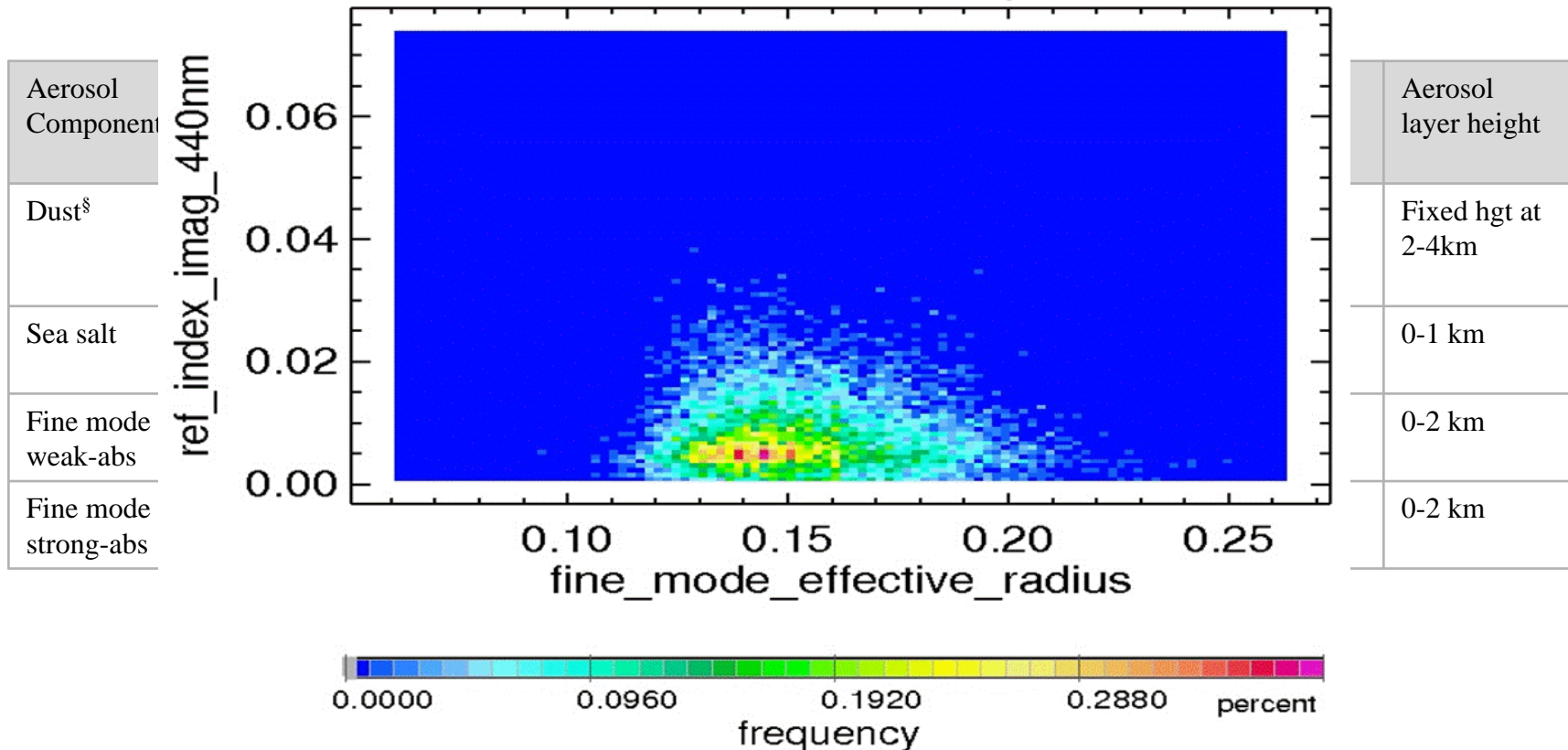


- define common small set of components for inter-comparisons
- mixing by fine mode fraction, coarse (salt or dust), fine mode absorption
- test AEROCOM median a priori
- test retrievals with fixed a priori and free selection of properties

Aerosol Component	Real part Refr. Index (550 nm)	Im. Part Refr. Index (550 nm)	Reff* (μm)	Geom. stdv	Geometric mean radius (μm)	Comments	Aerosol layer height
Dust [§]	1.56 (varies with wavelength) [§]	0.0018 (varies with wavelength) [§]	1.8	1.82	0.79	Non-spherical	Fixed hgt at 2-4km
Sea salt	1.4	0	1.82	1.7	0.9	AOD threshold constraint [#]	0-1 km
Fine mode very weak-abs	1.4	0.003	0.142	1.7	0.07	(ssa at 500 nm: 0.98)	0-2 km
Fine mode strong-abs	1.5	0.025	0.142	1.7	0.07	(ssa at 500 nm: 0.80)	0-2 km



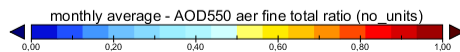
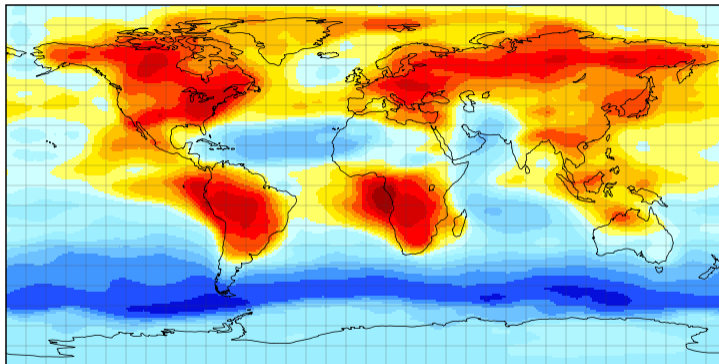
- define **common small set of components** for inter-comparisons
- mixing by fine mode fraction, coarse (salt or dust), fine mode absorption
- test AEROCOM median a priori
- test retrievals with fixed a priori and free selection of properties



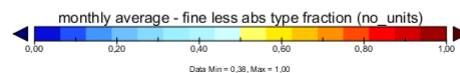
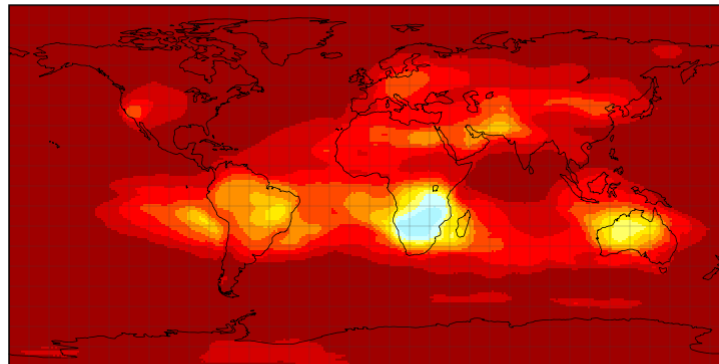


- AEROCOM + AERONET Stefan Kinne (later talk)
- used to prescribe aerosol type or use it as (partial) apriori in several test datasets

monthly average - AOD550 aer fine total ratio

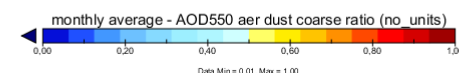
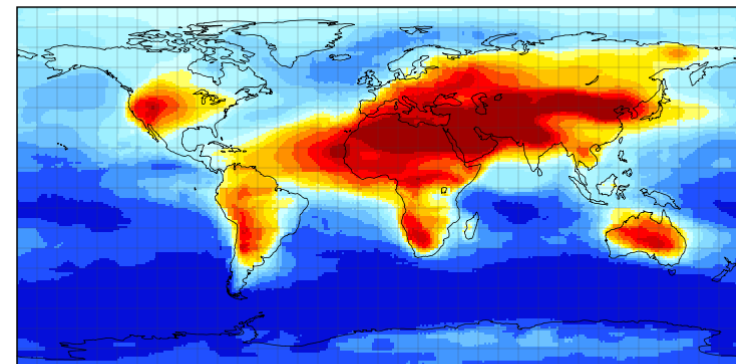


monthly average - fine less abs type fraction



3 fractions:
 fine mode
 fine mode absorbing
 coarse mode dust

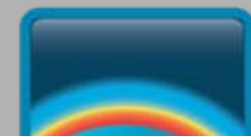
monthly average - AOD550 aer dust coarse ratio





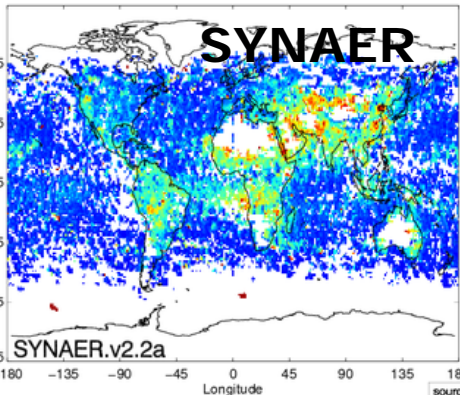
- using **AEROCOM tools**
 - start with focus on **daily 1-degree level3**
 - start with AOD550
 - add fine / coarse mode, Angstrom coefficient, AOD error
 - compare to AERONET and MISR / MODIS
 - compare to AEROCOM median and MACC
- add more tools: ICARE, MPI scoring
 - add level2 (10x10 km² / pixel level) comparison
 - add regional scoring

Baseline 9/2008



OD550_AER 2008 09 mean 0.092

SYNAER

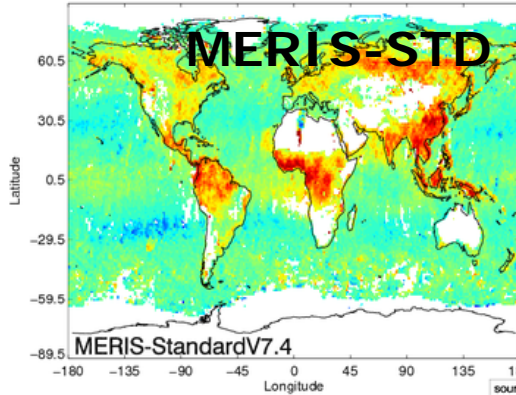


SYNAER.v2.2a

source: AEROCOM

OD550_AER 2008 09 mean 0.273

MERIS-STD

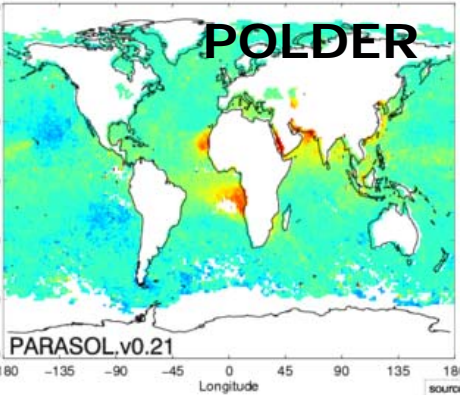


MERIS-StandardV7.4

source: AEROCOM

OD550_AER 2008 09 mean 0.171

POLDER

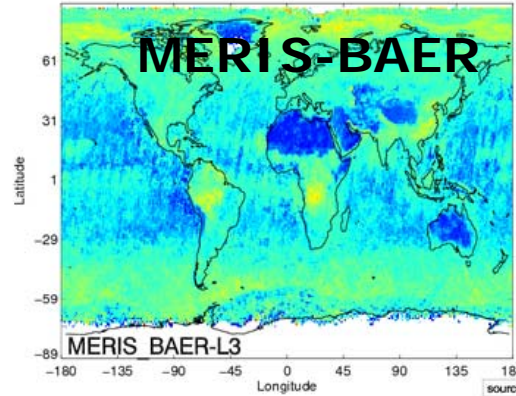


PARASOL.v0.21

source: AEROCOM

OD550_AER 2008 09 mean 0.121

MERIS-BAER

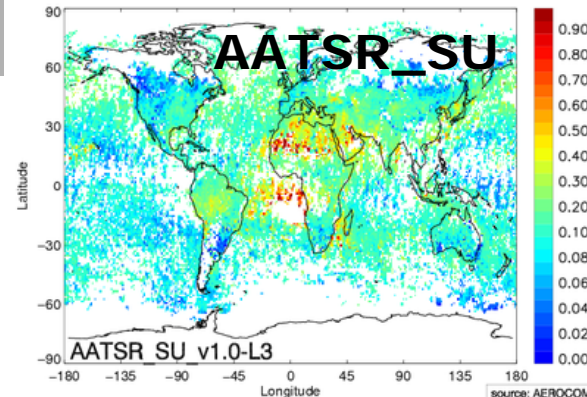


MERIS BAER-L3

source: AEROCOM

OD550_AER 2008 09 mean 0.167

AATSR_SU

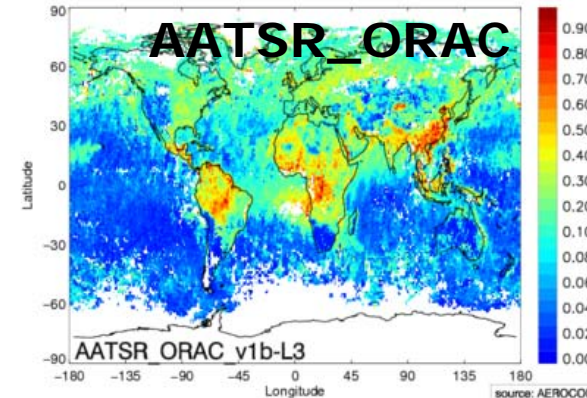


AATSR SU v1.0-L3

source: AEROCOM

OD550_AER 2008 09 mean 0.143

AATSR_ORAC

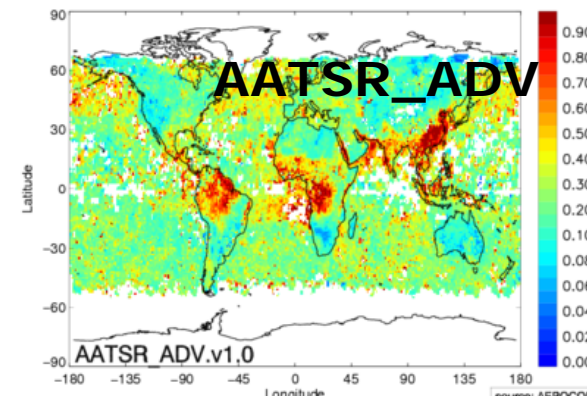


AATSR ORAC v1b-L3

source: AEROCOM

OD550_AER 2008 09 mean 0.319

AATSR_ADV

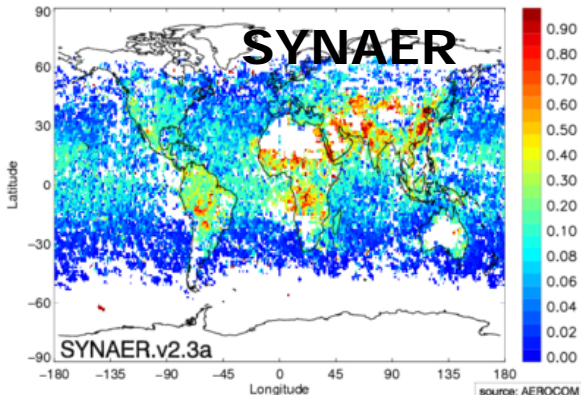


AATSR ADV.v1.0

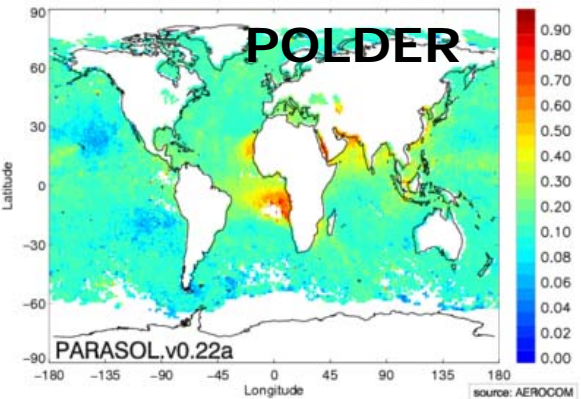
source: AEROCOM



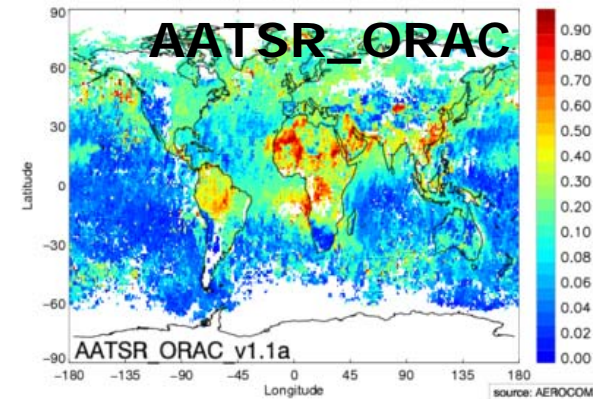
OD550_AER 2008 09 mean 0.130



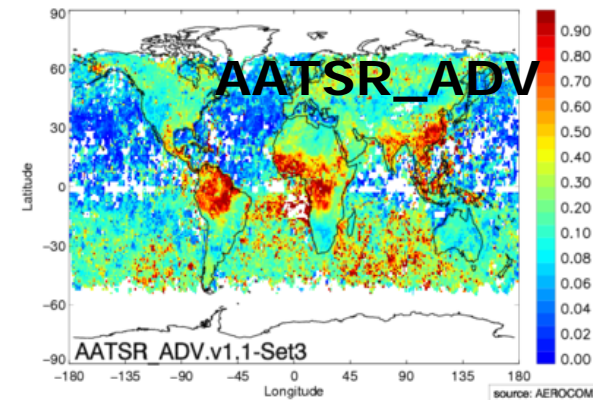
OD550_AER 2008 09 mean 0.171



OD550_AER 2008 09 mean 0.156

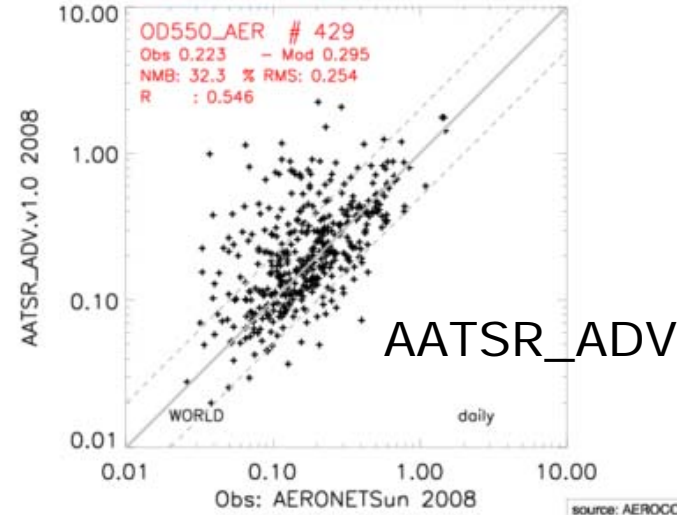
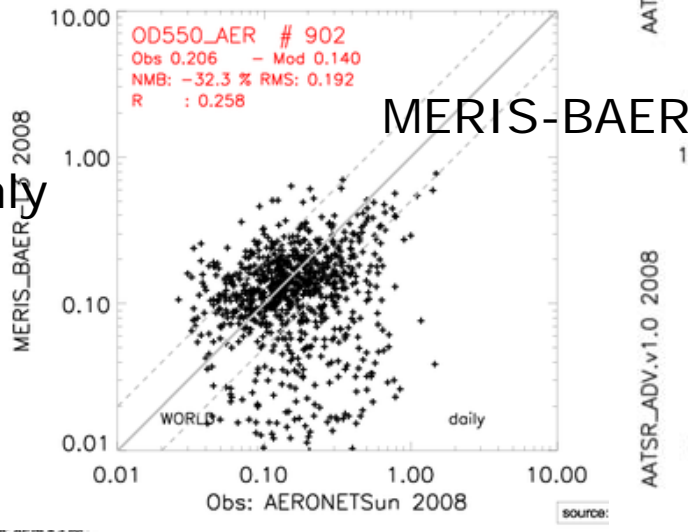
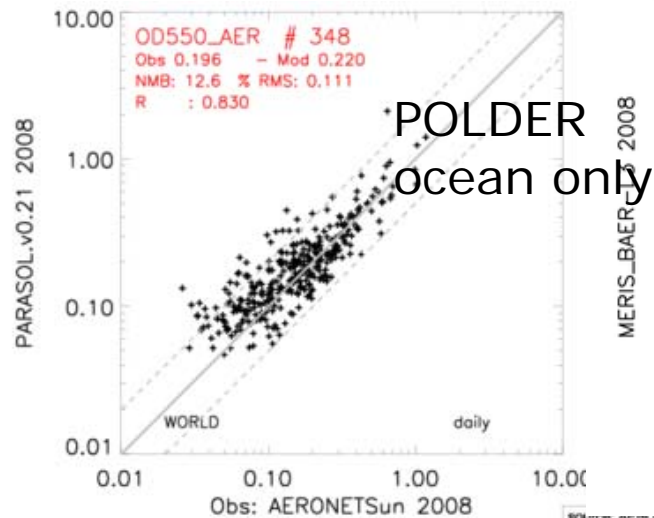
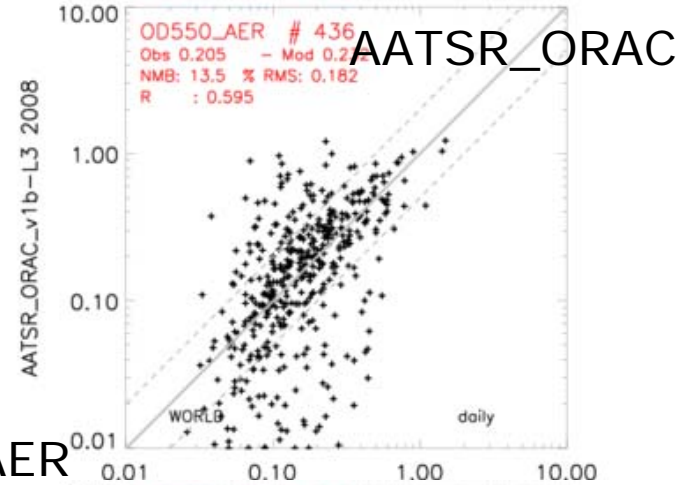
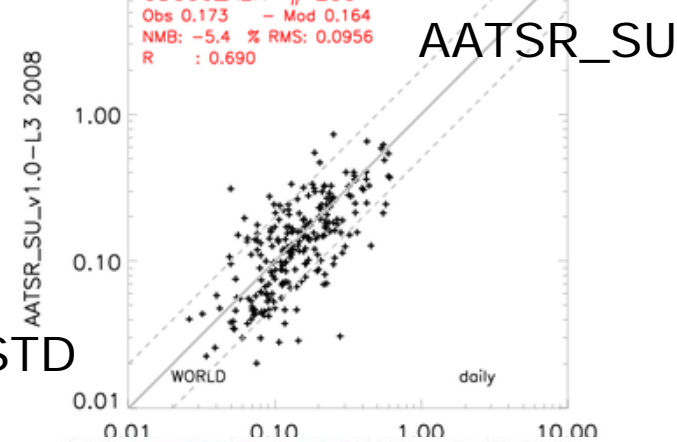
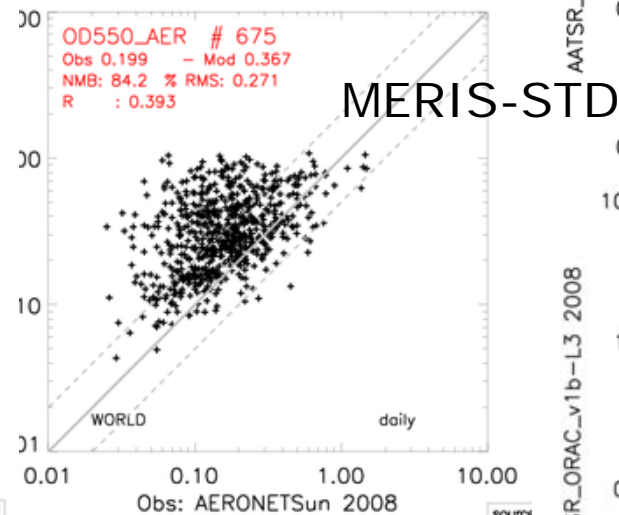
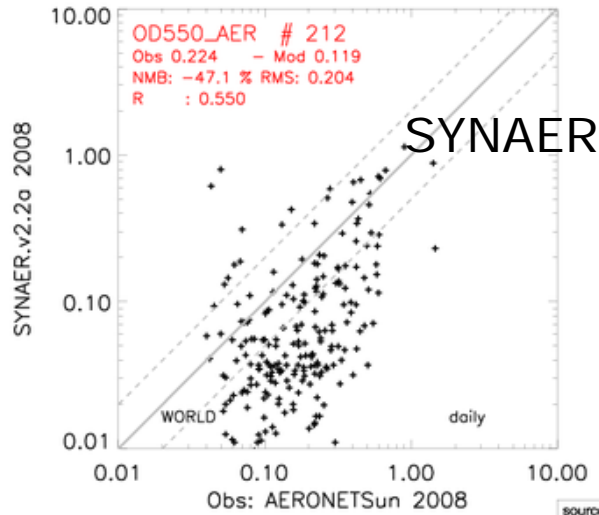


OD550_AER 2008 09 mean 0.261



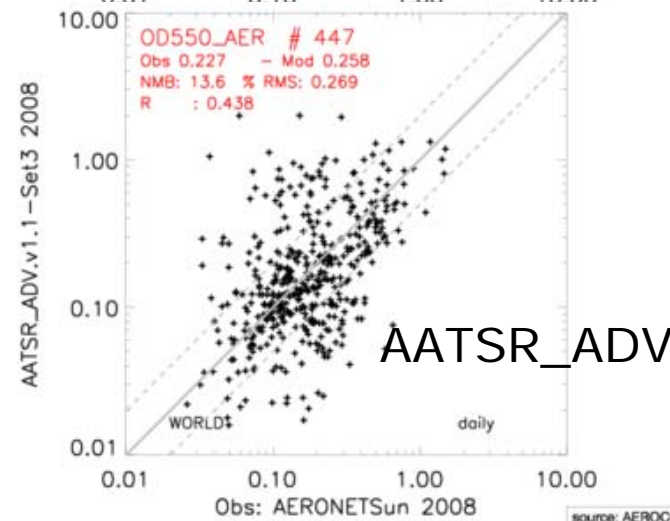
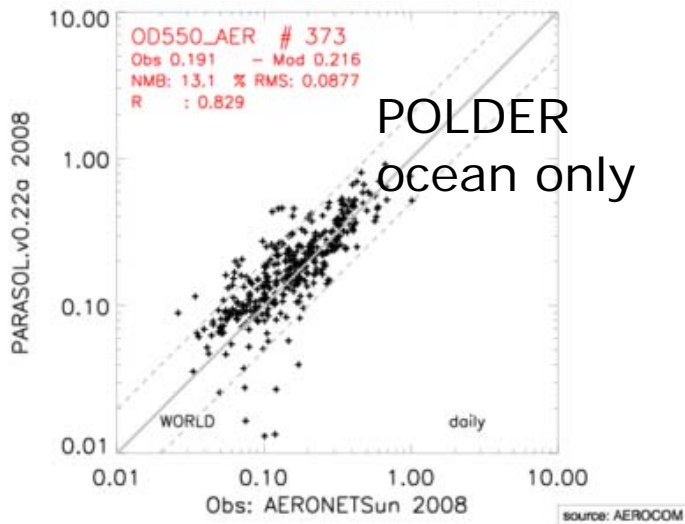
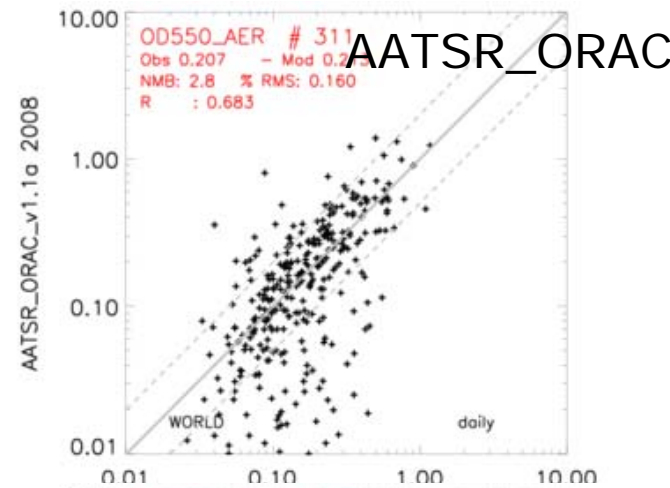
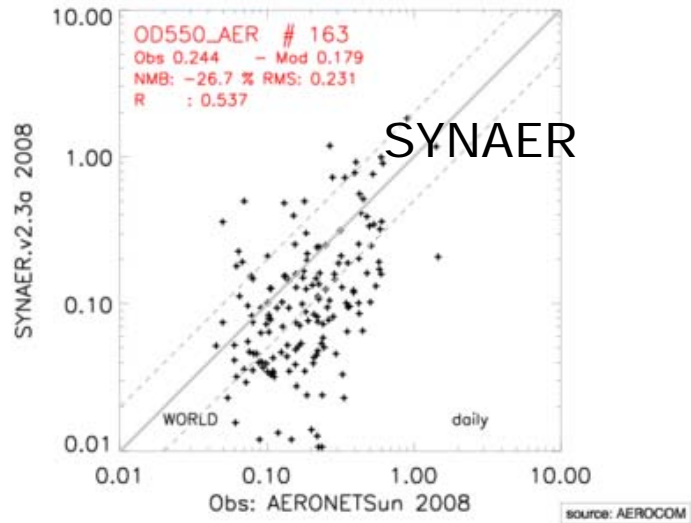


baseline scatter

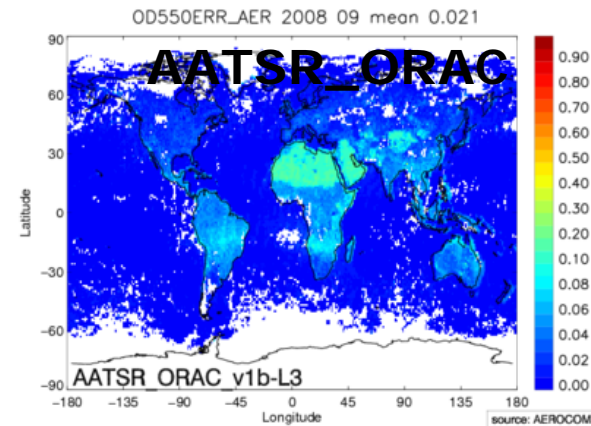
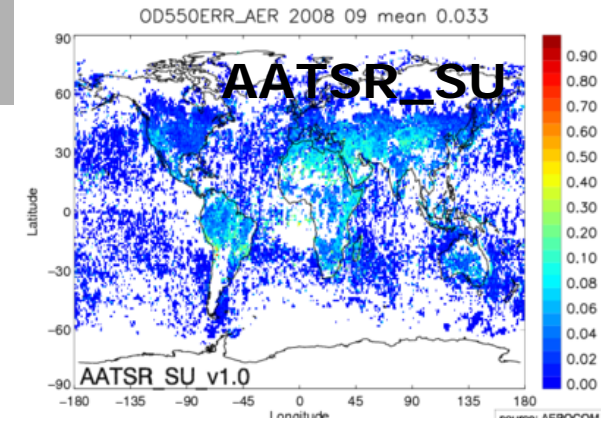
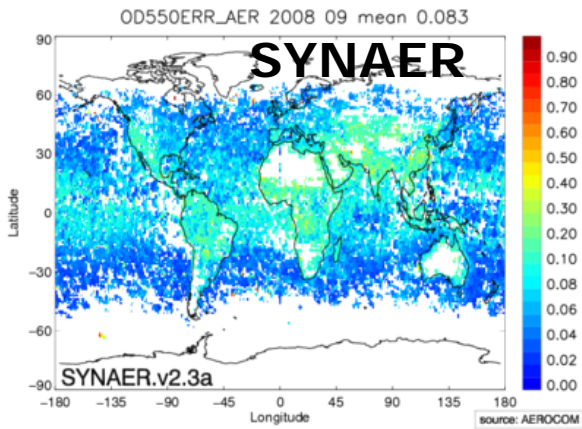
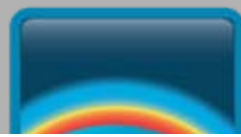




common aerosol scatter

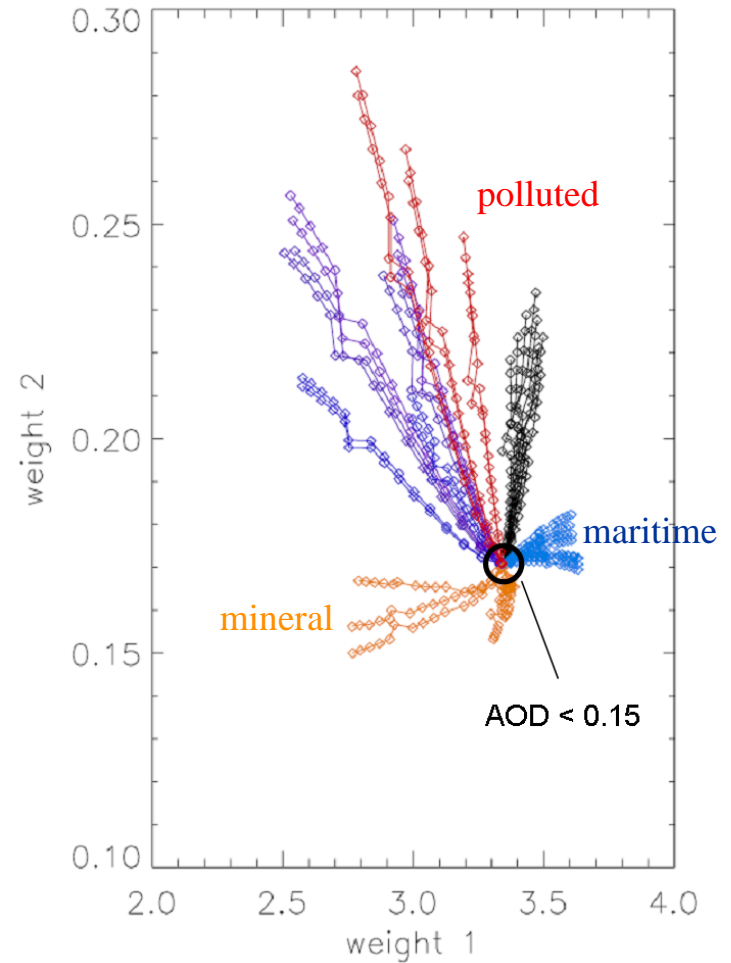
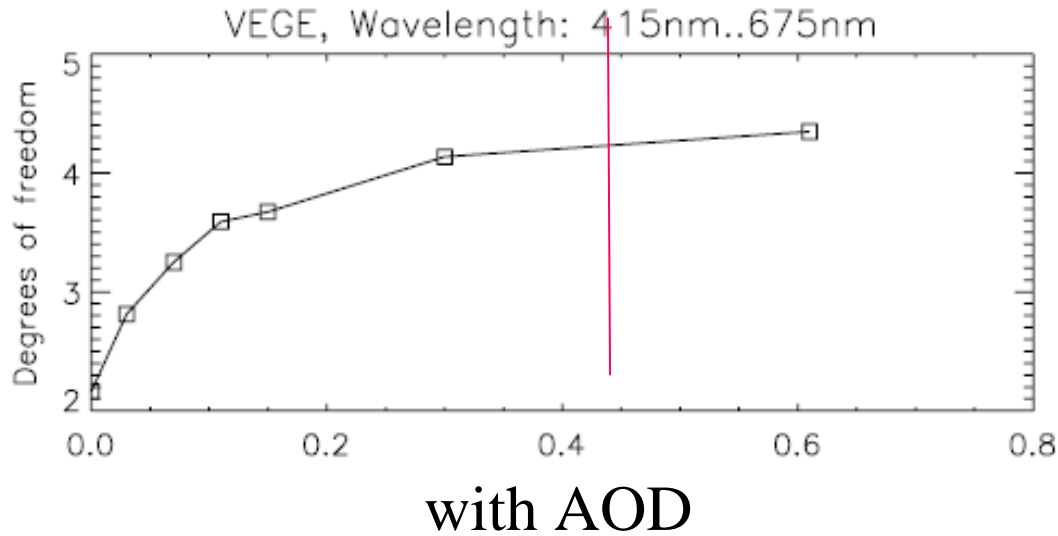


AOD error

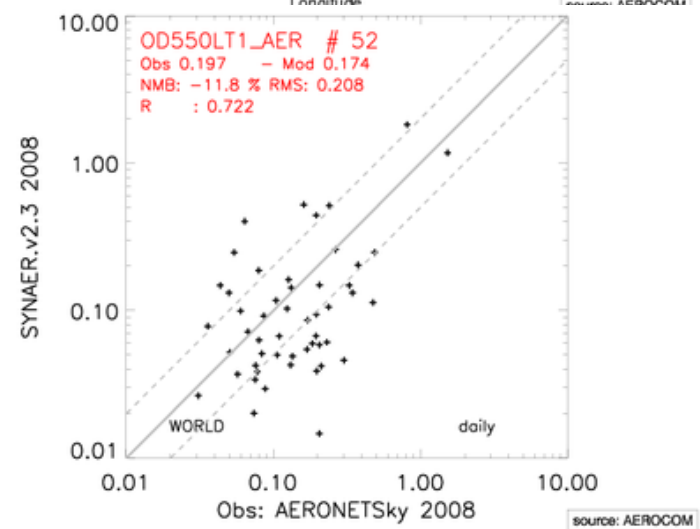
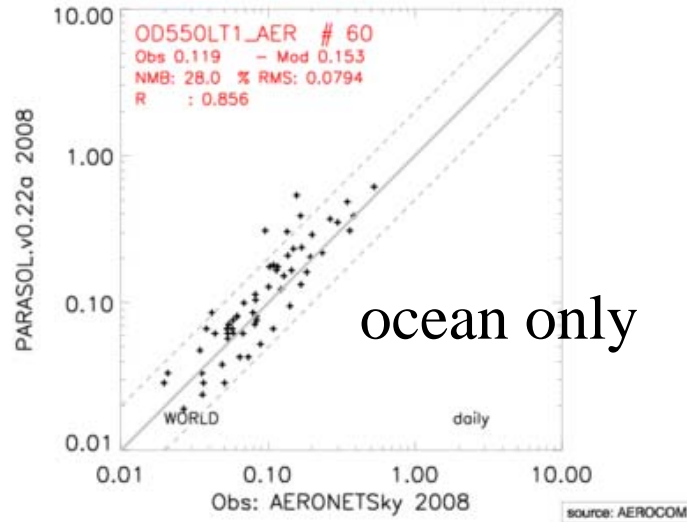
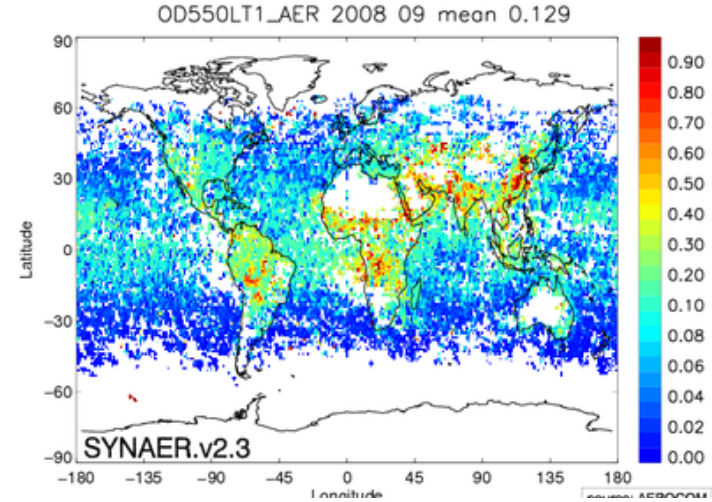
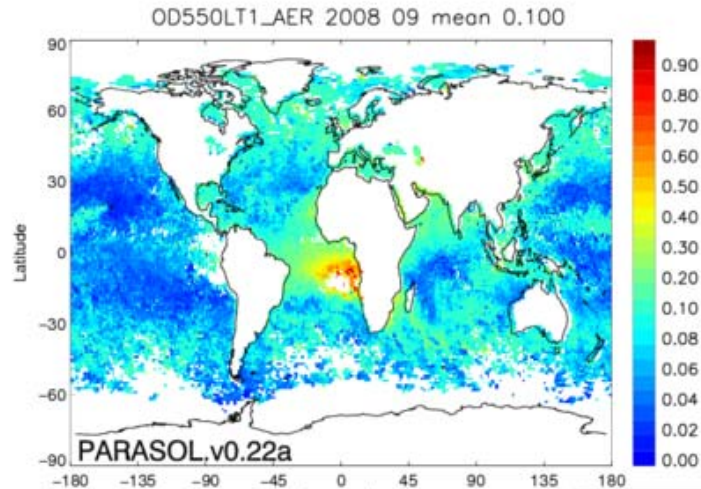




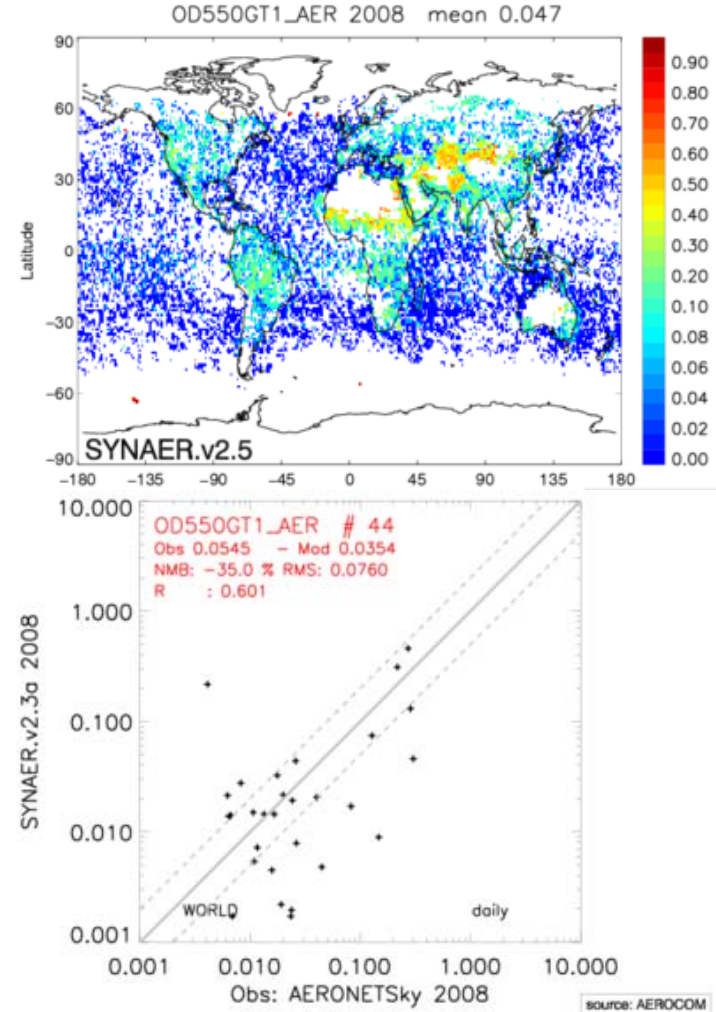
SYNAER: analyzed information content of spectrometer



Fine mode AOD



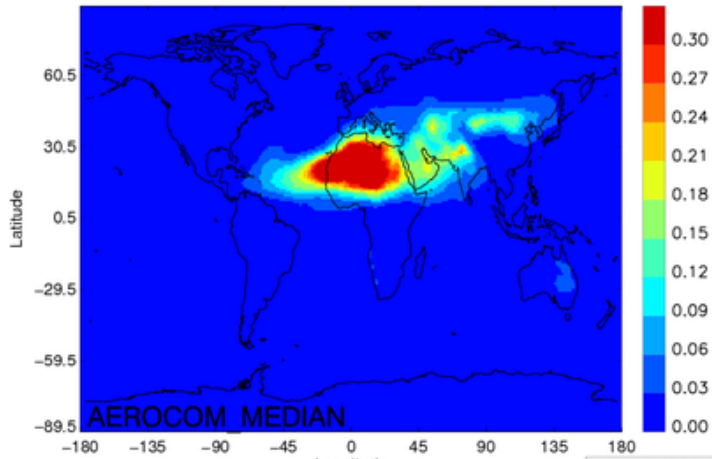
Coarse mode AOD



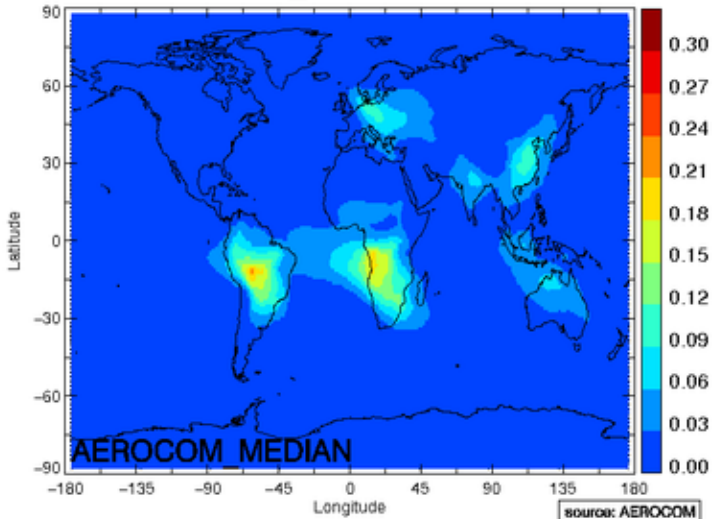
components



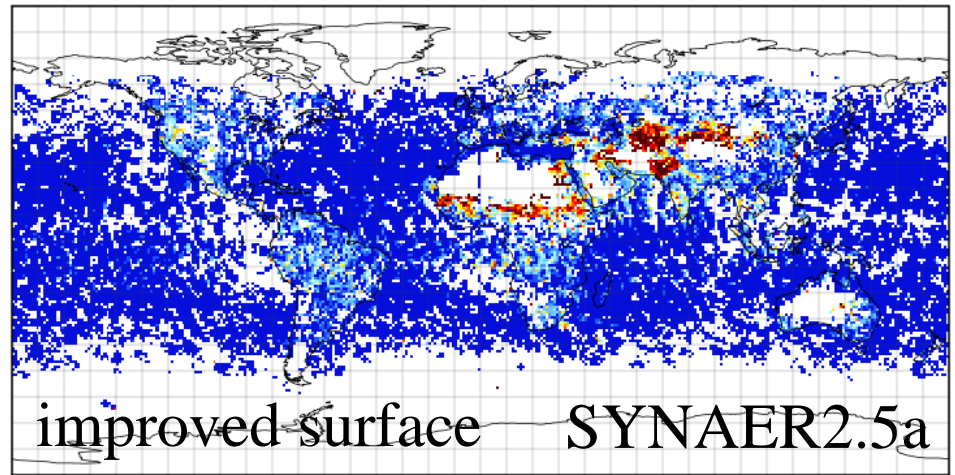
AEROCOM_MEDIAN OD550_DUST 2000 09 mean 0.023



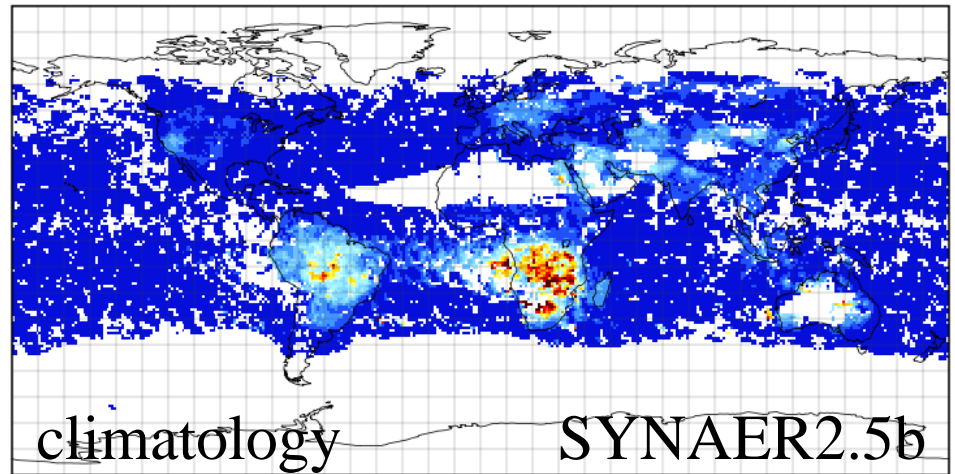
OD550_POM 2000 09 0.018



Coarse mode Dust Aerosol optical depth at 550 nm



Fine mode strongly absorbing Aerosol optical depth at 550 nm





- aerosol_cci analysis is ongoing
- comparing test datasets indicate
 - quantitative reasons of errors / uncertainties
 - potential for improvements
 - convergence of algorithms
- future developments will look into
 - cloud masking, surface treatment
 - merging (error-weighted, probability distributions)
 - further analysis of synergetic information content
 - further synergetic use of instruments

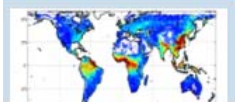


climate change initiative
European Space Agency

[ESA](#) | [CCI](#) | [aerosol](#) | [cloud](#) | [cmug](#) | [fire](#) | [ghg](#) | [glaciers](#) | [land cover](#) | [ocean colour](#) | [ozone](#) | [sea ice](#) | [sea level](#) | [sst](#)

aerosol

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Second newsletter is published

Submitted by AerosolCciPartner on Wed, 2011-07-20 17:42

The second newsletter summarizes the major activities and achievements up to the end of the first project year.

It is available here:

[CCI_Newsletter_No2_aerosol.pdf](#)

Fourth quarterly report published

Submitted by administrator name on Wed, 2011-07-20 16:50

Close to the end of the first project year the fourth quarterly report has been published.

It is available here:

[Aerosol_cci_QPR_2011_Q2_v1.0.pdf](#)

Third progress meeting held at ICARE / Lille

Submitted by AerosolCciPartner on Wed, 2011-05-18 16:41



The third progress meeting was successfully held at ICARE in Lille.

The consortium discussed the most critical algorithm modules and plans for harmonizing or improving them between the precursor algorithms. First global test datasets for September 2008 have been processed with all precursor algorithms. Their validation with AEROCOM, ICARE and MPI tools has started and will be the baseline for assessing the impact of all subsequent changes. [Read more »](#)

Quarterly progress report January-March 2011

Submitted by AerosolCciPartner on Tue, 2011-03-15 11:37

Project

The third Aerosol CCI quarterly report (15/01 - 15/03/2011) summarizes achievements made during this period.

User login

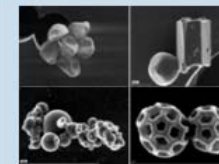
Username: *

Password: *

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Calendar

« July 2011 »

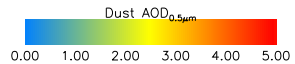
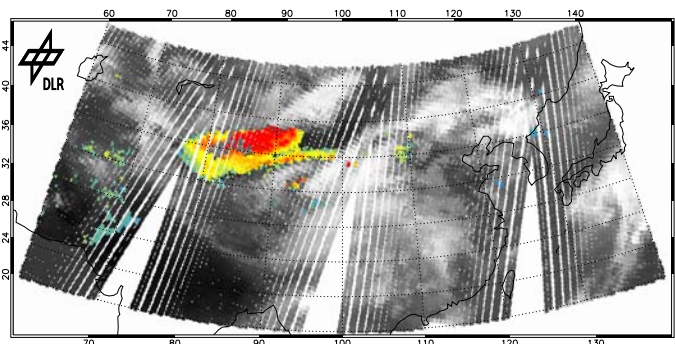
Mon	Tue	Wed	Thu	Fri	Sat	Sun
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Upcoming events

- First annual progress meeting (5 days)
- Expert workshop on

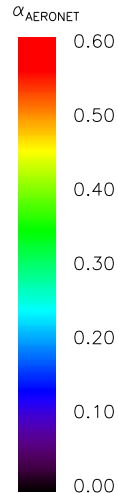
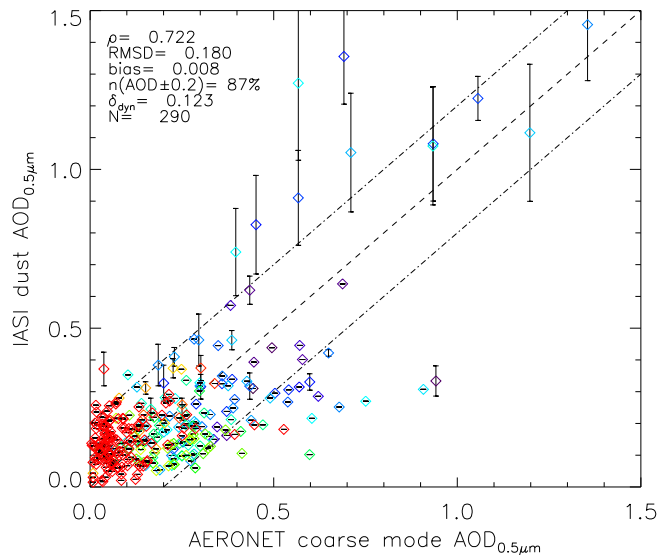


TIR: IASI dust AOD

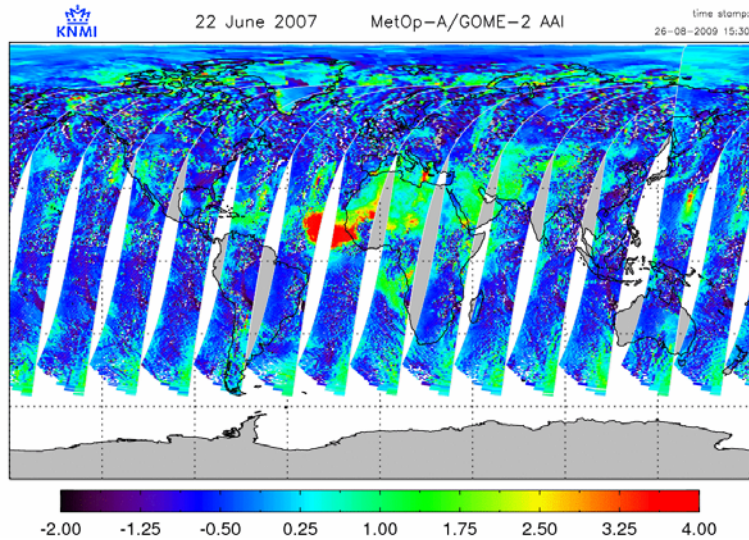


Apr 18, 2009
descending orbits

2009



UV: GOME-2 AAI



VIS: SYNAER/METOP

