

# AeroCom wrap up

Michael Schulz,

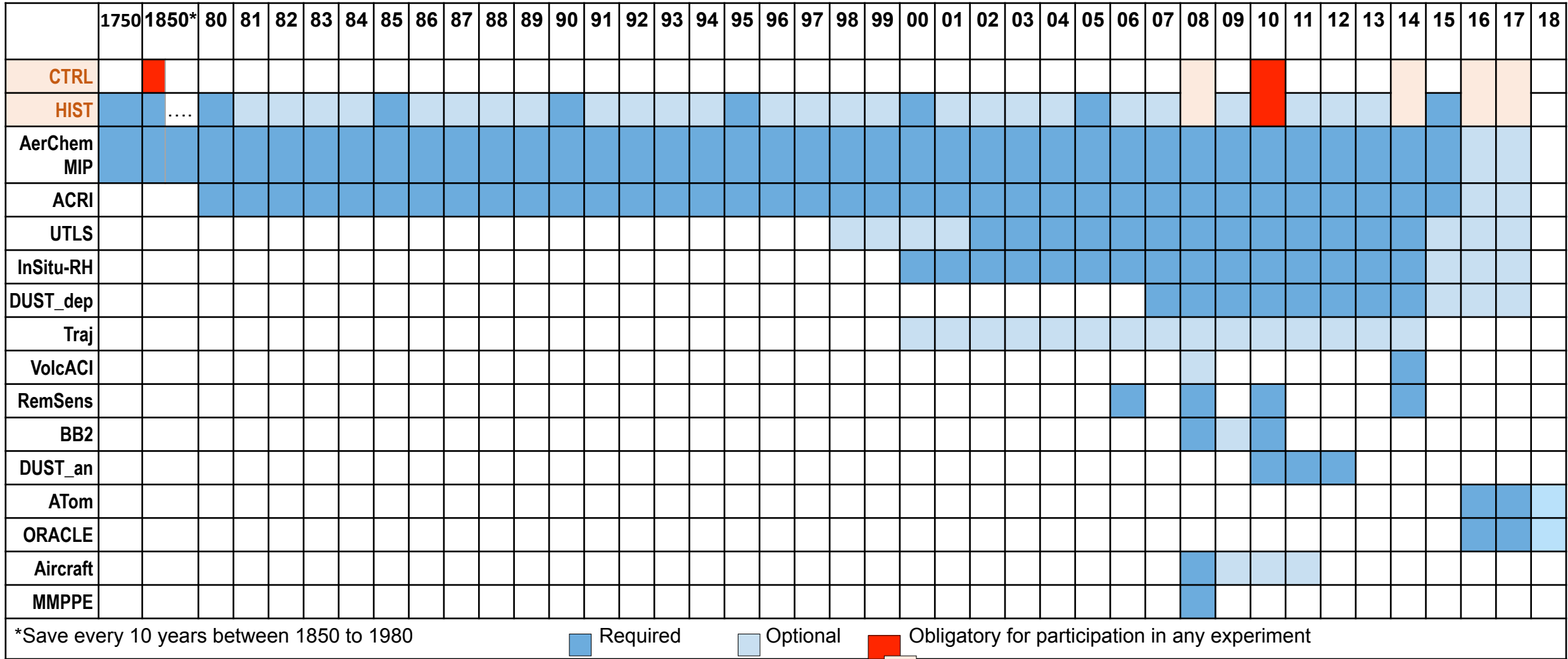
Norwegian Meteorological Institute (MetNo)

*16<sup>th</sup> AeroCom workshop, Helsinki, 11 Oct 2017*

# Proposition to clarify experiments

- Make the **Control** experiment required (can be within historical), should be done for 2010 and any other base year where single year experiments are requested (in particular 2008, 2006, 2014, 2016)
- Define per model **one historical** experiment as base experiment for several long term experiments. Ideal: varying SST, nudged, CMIP6 emissions, 1850-2015 (type of base simulation can be model specific: hist, histSST, histNud, histReAn, histCTM)
- Revise experiment descriptions, including file list (tier 1,2,3), perturbation experiment name list (tier 1,2,3)
- Revise database structure for phase III

# Coordination of AeroCom model studies/analysis: Currently proposed AeroCom model studies at-a-glance



CTRL – controlled experiment (Michael) - HIST – historic (Gunnar), ACRI, UTLS (Mian), AerChemMIP (Michael), VolcACI – volcanic ACI (Florent), RemSens (Nick) BB2 – BB phase 2 (Maria/Mariya), InSitu-RH – in site hygroscopicity experiment (Betsy/Paul Z), DUST\_an – anthropogenic dust (Paul G), DUST\_dep – dust deposition (Hongbin), ATom (Huisheng), ORACLE (Sarah D), Aircraft (Duncan), MMPPE – perturbation (Lindsay), TRAJ – trajectory (David Patridge)

# Template for new/revised experiment description

- Exp description (2-3 pages) Motivation & introduction, goals, outcome
- Input, years to be simulated, reference to control/hist
- Description of perturbations (assuming CONTROL or HISTORICAL as base)
- Description of extra diagnostics (extra wrt Control/Hist experiment)
- List of names of perturbations and explanations (tier/priority 1, 2,3 )
- List of names of variables, with motivation/explanation (tier/priority 1, 2,3 )
- List of required output files
- FAQ
- References

# File lists per experiment ....can be checked more easily

**aerocom3\_<ModelName>\_<ExperimentName>\_<VariableName>\_<VerticalCoordinateType>\_<Period>\_<Frequency>.nc**

## **Examples**

Directory GOCARTv4\_CTRL

aerocom3\_GOCARTv4\_CTRL\_od550aer\_Column\_2010\_monthly.nc

.....

Directory GOCARTv4\_ACRI

aerocom3\_GOCARTv4\_ACRI-Vol0\_od550aer\_Column\_2010\_monthly.nc

aerocom3\_GOCARTv4\_ACRI-Vol0\_concash\_ModelLevel\_YEAR\_monthly.nc

aerocom3\_GOCARTv4\_ACRI-XXX\_concash\_ModelLevel\_1850\_monthly.nc

....

XXX= Perturbation Name VOL0 , BB0, ETC0

YEAR=2010, 2009

# Historical simulations experiment names follow CMIP6 naming convention

	Experiment ID	Minimum model configuration	CH <sub>4</sub>	N <sub>2</sub> O	Aerosol precursors	Ozone precursors	CFC/HCFC	Tier
AerChemMIP	<i>hist-piNTCF</i>	AOGCM AER	Hist	Hist	1850	1850	Hist	1
	<i>hist-piAer</i>	AOGCM AER	Hist	Hist	1850	Hist	Hist	2
	<i>histSST</i>	AGCM AER	Hist	Hist	Hist	Hist	Hist	1
	<i>histSST-piNTCF</i>	AGCM AER	Hist	Hist	1850	1850	Hist	1
	<i>histSST-piAer</i>	AGCM AER	Hist	Hist	1850	Hist	Hist	2
		<i>histSSTNud</i>						
AeroCom	<i>histCTM</i>							
	<i>histReAn</i>							
	<i>histCTM-ACRI-Vol0</i>							
	....							

# Restructuring of database

- One directory per model version and experiment
- For example

GOCARTv4\_CTRL

GOCARTv4\_UTLS

(several perturbations and additional diagnostics of an experiment are stored within one directory, for example UTLS-Vol0, UTLS-BB0, UTLS-ETC )

- One file per year and variable

(PD and PI are identified by year in file name)

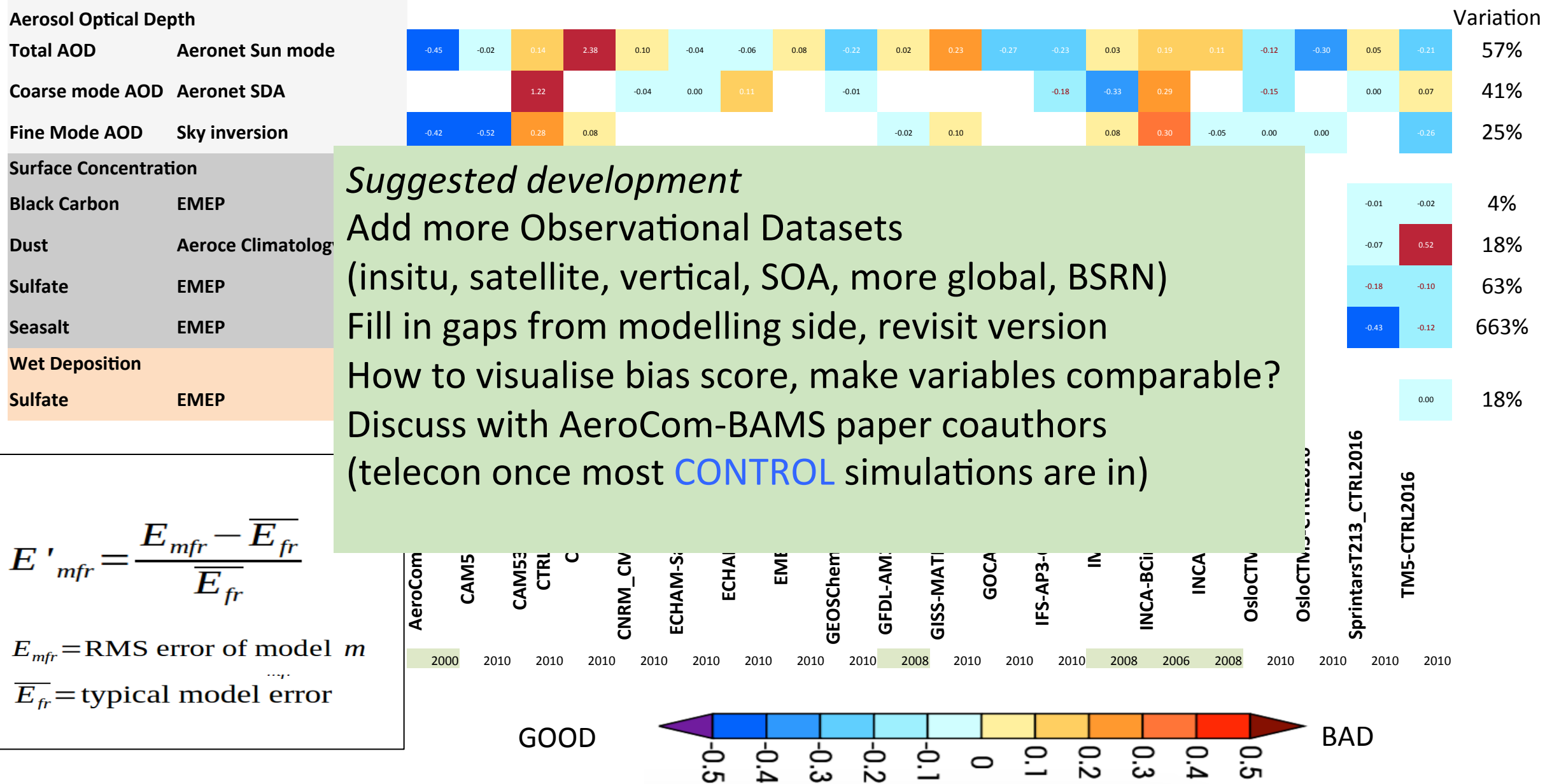
# First priorities

- Revise experiment descriptions
- Complete the CONTROL experiment as a base for a MEDIAN model and an AeroCom BAMS paper



# Portrait Diagram Display of Relative Error Metrics

## AeroCom Phase III Models vs Multiple Observational datasets



$$E'_{mfr} = \frac{E_{mfr} - \overline{E}_{fr}}{\overline{E}_{fr}}$$

$E_{mfr}$  = RMS error of model  $m$

$\overline{E}_{fr}$  = typical model error

Please check your **CONTROL** simulation here:  
[http://aerocom.met.no/cgi-bin/aerocom/surfobs\\_annualrs.pl](http://aerocom.met.no/cgi-bin/aerocom/surfobs_annualrs.pl)

- AEROCOM phase II INTERFACE - MODEL versus DATA, Model maps & scores

Project: AEROCOM    Subset: AeroCom Median 2017    Explicit-1-panel    reset    share    help

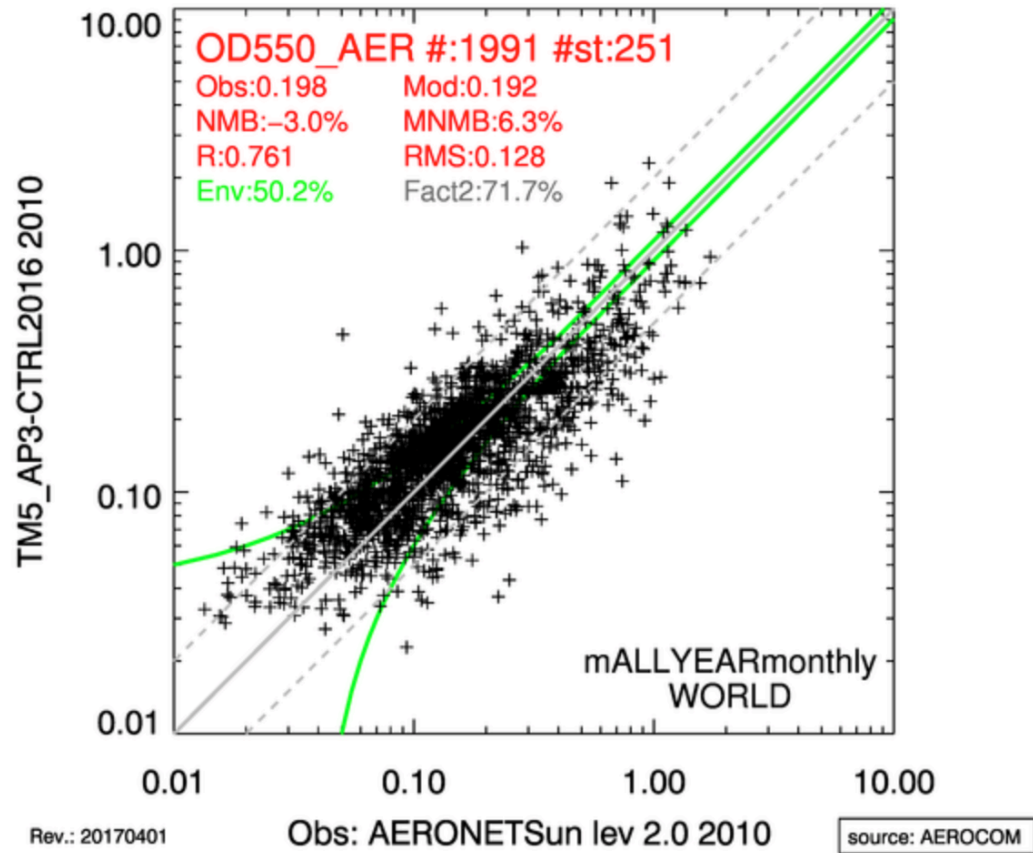
Graph Type: SCATTERLOG Scatter plot observations against dataset, on log  $\epsilon$

Data Set / Model: TM5\_AP3-CTRL2016

Parameter: OD550\_AER

Place-Year-Freq: WORLD    an2010    Monthly All Year

Reference: AERONETSun2.0



Models Expected  
CTRL year 2010

- NorESM
- INCA
- GISS MATRIX
- GISS OMA
- UKESM/Hadgem
- SPRINTARS
- GEOS5
- CNRM-CM6
- TM5/EC-EARTH
- GFDL
- CAM5/CESM2
- BCC
- IFS
- ECHAM6-HAM2
- ECHAM-SALSA
- GEOSCHEM
- OsloCTM3
- IMPACT
- GOCART
- EMEP
- SILAM

# AeroCom BAMS paper

- Introduction (Michael)
- History of AeroCom, major findings (Johannes, Gunnar)
- Overview of phase III experiments (Mian)
- Description of database, webinterface and tools (Jan)
- AeroCom P3 Median Model (Michael)
- Comparison to phase I and II (Michael) budgets, diversity,
- Performance Matrix (RMS, bias) AeroCom Phase III Models vs Observations (Michael)
- Recommendations and open questions from AeroCom papers (*lead authors from these papers plus volunteers, each 0.5 page*) suggestion: Huisheng (nitrate), Gunnar (forcing), Steve/Johannes (Indirect), HTAP (Mian), Dust (Yves), Vertical constraints (Philip), AOD (Stefan), Optical properties Insitu (Betsy), Black Carbon (Bjørn), Trends (Mian), BB (Ralph), POA&SOA (Kostas), CN, CDNC (??)
- Table with new experiments
- Summary (Michael)
- References (endnote)
- Supplement: Median Model, Table w model documentation of Models contributing to phase III Median, new experiment descriptions, format requirements

# Next actions

- Presentations/Poster pdfs of AeroCom workshop on web: ca Nov 10 (Stefan/Michael, first sent out to all contributors, password protected for checking)
- Template for Experiment description: Send out by Michael Friday to all
- aerocom3\_CTRL and aerocom3\_hist\* experiment description proposal send out Oct 20 (Michael; Mian, Gunnar, Philip)
- Reformatted and revised experiment description return until end of October to Michael (experiment leads)
- Renaming of AeroCom phase III
- database where possible (Jan)
- Contacting all models for CTRL submission Oct 20 (Michael) and sign up to other experiments
- AeroCom CTRL Model submission for BAMS paper: deadline Dec 31 (best before)
- Automated CF checker and file control for submissions (Jan and Duncan)
- Relative error matrix element suggestions End of October to Michael
- Telecon on Median model
- Text contributions for BAMS paper to Michael; end of November

# Forthcoming Meetings of relevance for AeroCom

- AGU fall, New Orleans, 10-14 Dec 2017
- EGU, Vienna, 8-13 April 2018 session “Radiative effects and global aerosol forcing estimates of natural and anthropogenic aerosols” (deadline 10.1.18)
- AerChemMIP-RFMIP-PDRMIP workshop, Reading, 11-15 June 2018
- 17<sup>th</sup> AeroCom workshop, Washington DC, 15-19 October 2018