

WHY

Aerosol optical depth (aot) comparisons to data from ground and space are preferred ways to demonstrate the skill of aerosol modules in global modeling. Comparisons among aerosol module detail demonstrate strong differences at sub-components, which may go unnoticed when looking at integrated properties. Specifically we have to wonder: *Are 'good' aot totals skillful, just luck (off-setting errors) or a matter of tuning?* Investigations of detailed aerosol output of control experiments as proposed in AEROCOM will tell.



Stefan Kinne (1) and authors
(1) MPI for Meteorology, Hamburg, Germany

Simulated aerosol components global fields of yearly averages and evaluations

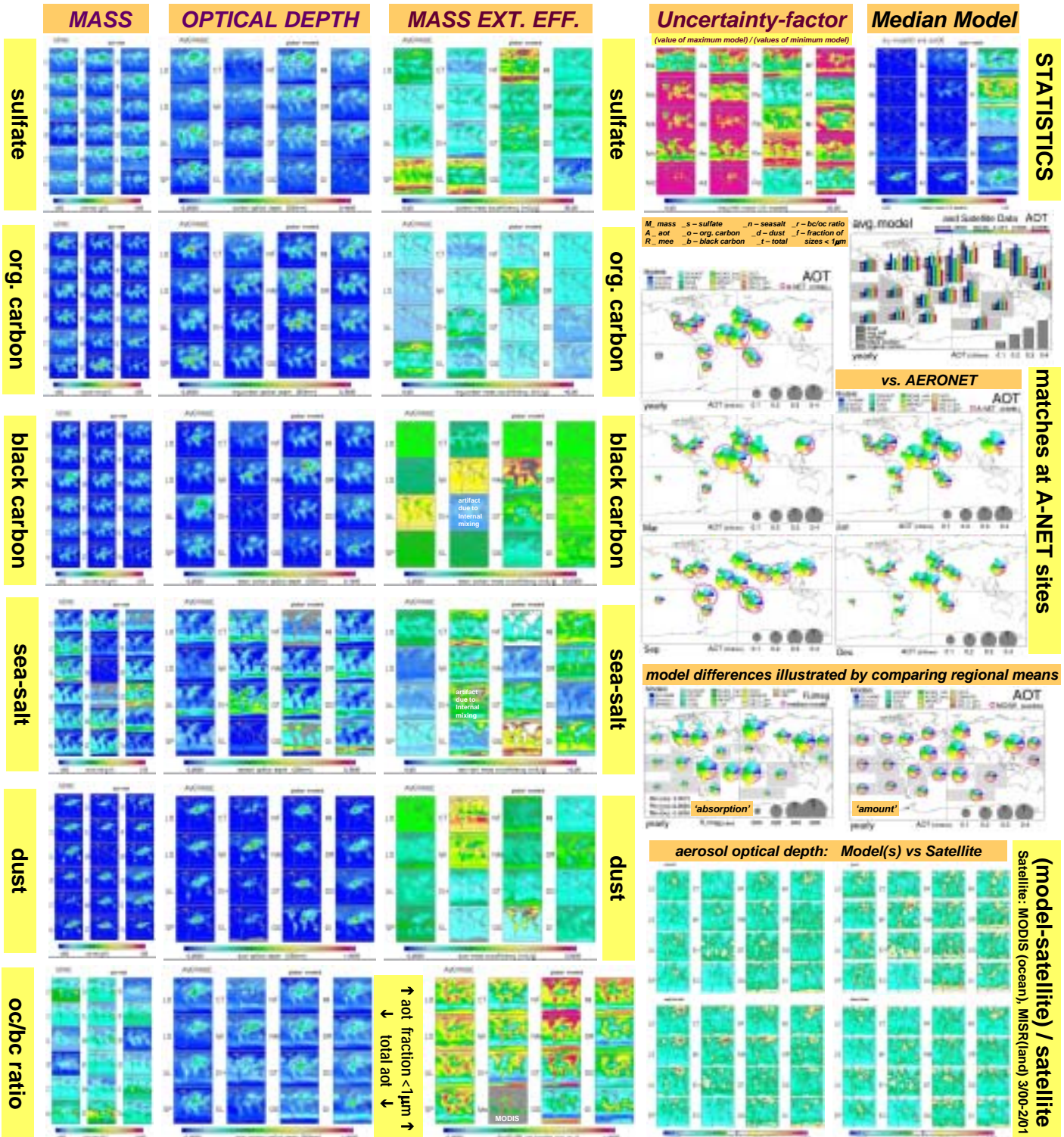
Models

Model	Resolution	Simulation	authors
LO LOA	3.8/2.5deg	yr 2000	Reddy / Boucher
LS LSCE	3.8/2.5deg	yr 2000	Schulz / Balkanski
UL ULAQ	10/22.5deg	yr 2000	Pitari / Montenaro
SP SPRINTARS	1.3/1.3deg	yr 2000	Takemura
CT CANADA	2.8/2.8deg	1yr avg	Gong
MI MIRAGE	2.5/2.0deg	yr 2000	Ghan / Easter
EH ECHAM5-hh	1.9/1.9deg	3yr avg	Stier / Feichter
EL ECHAM4	3.8/3.8deg	3yr avg	Lohmann / Feichter
NF NCAR-Match	1.9/1.9deg	yr 2000	Fillmore / Collins
NM NCAR-Mozart	2.8/2.8deg	1yr avg	Tie / Brasseur
OT OSLO CTM	2.8/2.8deg	yr 1996	Myhre / Isaksen
OG OSLO GCM	2.8/2.8deg	3yr avg	Seland / Iversen
IM IMPACT	2.5/2.0deg	3yr avg	Liu / Penner
GR GRANTOUR	5.0/5.0deg	1yr avg	Herzog / Penner
GO GOCART	2.0/2.5deg	yr 2000	Chin / Ginoux
GI GISS	4.0/5.0deg	3yr avg	Koch / Tegen
EM ECHAM5-dlr	3.8/3.8deg	3yr avg	Lauer / Sausen
TM TMS	4.0/6.0deg	3yr avg	Krool / Dentener

RESULTS

- overall agreement for source location, but differences in strength
 - large differences in simulated transport (and / or removal rates)
 - large differences in conversion (of mass into optical depth) due to
 - size assumptions
 - humidification assumptions
 - ambient relative humidity used
- extra comparisons needed to Identify / remove poor assumptions

RESULTS



next

AEROCOM project
⇒ detailed evaluations

- to understand reasons for differences in mass to optical depth conversions among models: *identical year, identical water uptake*
- to identify major causes for differences in mass distribution, including transport: *identical inventories (sources), identical meteorology*
- to understand observed seasonal and regional patterns of aerosol/chemistry: *satellite data, field studies, long-term monitoring*