WHY

The visible aerosol optical depth is the most fundamental property to characterize atmospheric aerosol, thus the primary property in aerosol remote sensing. Many different global multi-year data are offered from different sensors - at less accuracy and coverage over land. Discrepancies to aerosol simulations of global model can identify regions and season with problems (problems in remote sensing and / or problems in modeling). Agreement in aerosol optical depth comparisons are NOT sufficient to validate aerosol component models

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Satellite	Measurements	Authors
MO MODIS	(2001)	Chu / Kaufmann
MI MISR	(2001)	Kahn / Martonchic
AV AVHRR	(1983-2001)	Mishchenko / Geo.
TO TOMS	(1979-2001)	Torres / Herman
PO POLDER	(1986-1987)	Goulomb / Tanre
MM MODIS (primar	y) / MISR (secondary)	
MT MODIS (primary) / TOMS (secondary)	

Models LO LOAResolutionSimulationAuthorsLO LOA3.75/2.5degyr 2000Reddy / BoucherLS LSCE3.75/2.5degyr 2000Schulz / BalkanskiUL ULAQ10/22.5degyr 2000Pitari / MontenaroSP SPRINTARS1.3/1.3degyr 2000FakemuraCA CANADA2.8/2.8degyr avgGongMI MIRAGE2.5/2.0degyr 2000Ghan / EasterNF NCAR-Match1.9/1.9degyr 2000Ghan / EasterNG NCAR-Match2.8/2.8degyr avgTiel BrasseurOT OSLO2.8/2.8degyr avgTiel ParaseurEH ECHAMS2.8/2.8deg3yr avgLiu' PennerEH ECHAM52.8/2.8deg3yr avgLohmann/Feichter2.6/2.6deg3yr avgLohmannGO GOCART2.0/2.5deg1yr avgHerzog / PennerGI GISS4.0/5.0deg1yr avgHerzog / PennerGI GISS4.0/5.0deg5yr avgKoch / TegenAH ADAM42.5/3.8deg5yr avgKoch / Tegen	Ground Aer AERONET	Measure (1998-200	Authors Holben / Eck		
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	HA HADAM4	2.5/3.8deg	5yr avg	Roberts / Jones	

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	3.75/2.5deg	yr 2000	Schulz / Balkanski		5	
	10/22.5deg	yr 2000	Pitari / Montenaro		~	
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	2.5/2.0deg	yr 2000	Ghan / Easter			
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	2.5/2.0deg	3yr avg	Liu/ Penner			
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	4.0/5.0deg	3yr avg	Koch / Tegen			
4	2.5/3.8deg	5yr avg	Roberts / Jones			_

MODEL DEVIATIONS with respect to AERONET (1998-2001) DEVIATION





AEROSOL OPTICAL DEPTH

Iarge differences in simulated aerosol optical depths among models more recent models have compensated for underestimates to satellites distribution is often unsatisfactory (sources stronger, remotely weaker)

RESULTS

- many models tend to overestimate (N.Africa) dust and urban sources models struggle with biomass seasons – especially in South America
 - models are usually too weak in remote regions

AEROSOL OPTICAL DEPTH





MODEL DEVIATIONS with respect to MODIS/MISR (2001) yearly (↓) by season (⇔) DEVIATION global models LO OT GC CA LS MI GR IM NF UL EH GI SP EL NM HA

oerosol optical depth (550nm)

-0.400

next





- to establish the best global data-sets on aerosol properties (not just aot) for chosen years of model-simulations:: a community effort ! AEROCOM project - to destablish the best global data-sets on aerosol properties (nor just adv) for closer source of intervention of the order provide component: express sensor needs to identify data or sensors, which can provide constraints to simulations of any particular aerosol component: express sensor needs to identify data or sensors, which can provide constraints to simulations of any particular aerosol component: express sensor needs to identify data or sensors, which can provide constraints to simulations of any particular aerosol component: express sensor needs to identify data or sensors, which can provide constraints to simulations of any particular aerosol component: express sensor needs to identify data or sensors. - to identify regions / seasons, where deviations among measurements and to and among models require more detail: express data needs !

0.700