

Remote sensing evaluation of AEROCOM models

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Holzer-Popp, L. Klueser, P. Leonard, G. de Leeuw, R. Levy, A.
Lyapustin, P. North, J. Redemann, A. Sayer, V. Sayer, L.
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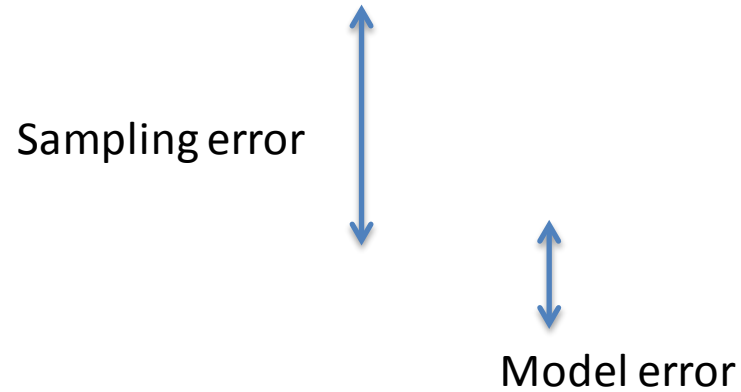
Intro

- Satellite remote sensing datasets provide near global coverage at fairly high temporal resolution (> few days)
- Ground based networks provide baseline

Goals

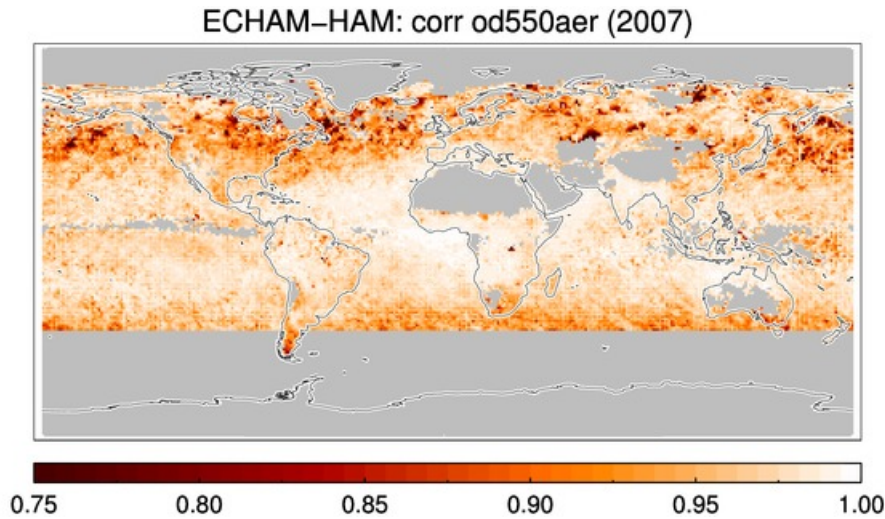
- Inventory model – obs discrepancies
- Identify model errors
- Understand basic causes of those errors
- $M - O = \varepsilon_M + \varepsilon_O + \varepsilon_{xyt}$
- Inventory obs diversity / errors (ground truth)

Representativeness of observations



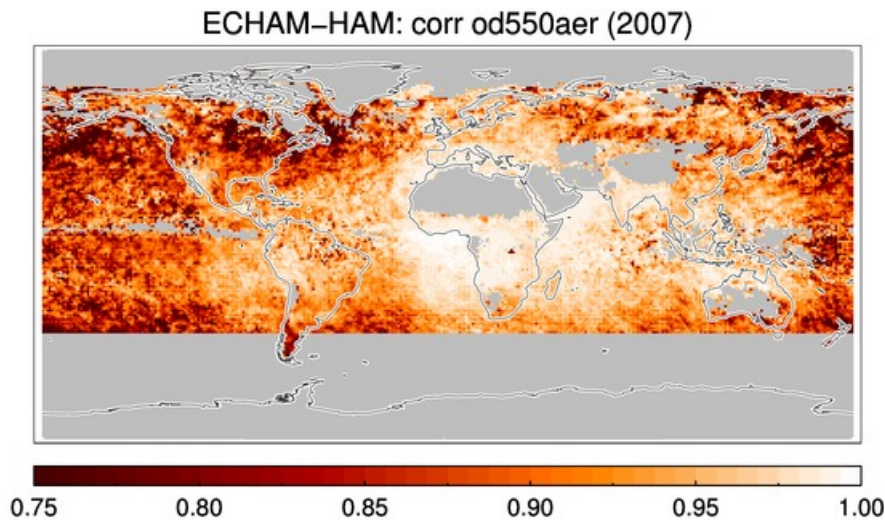
Representativeness of observations

A day is defined as the 24 hours surrounding a MODIS overpass

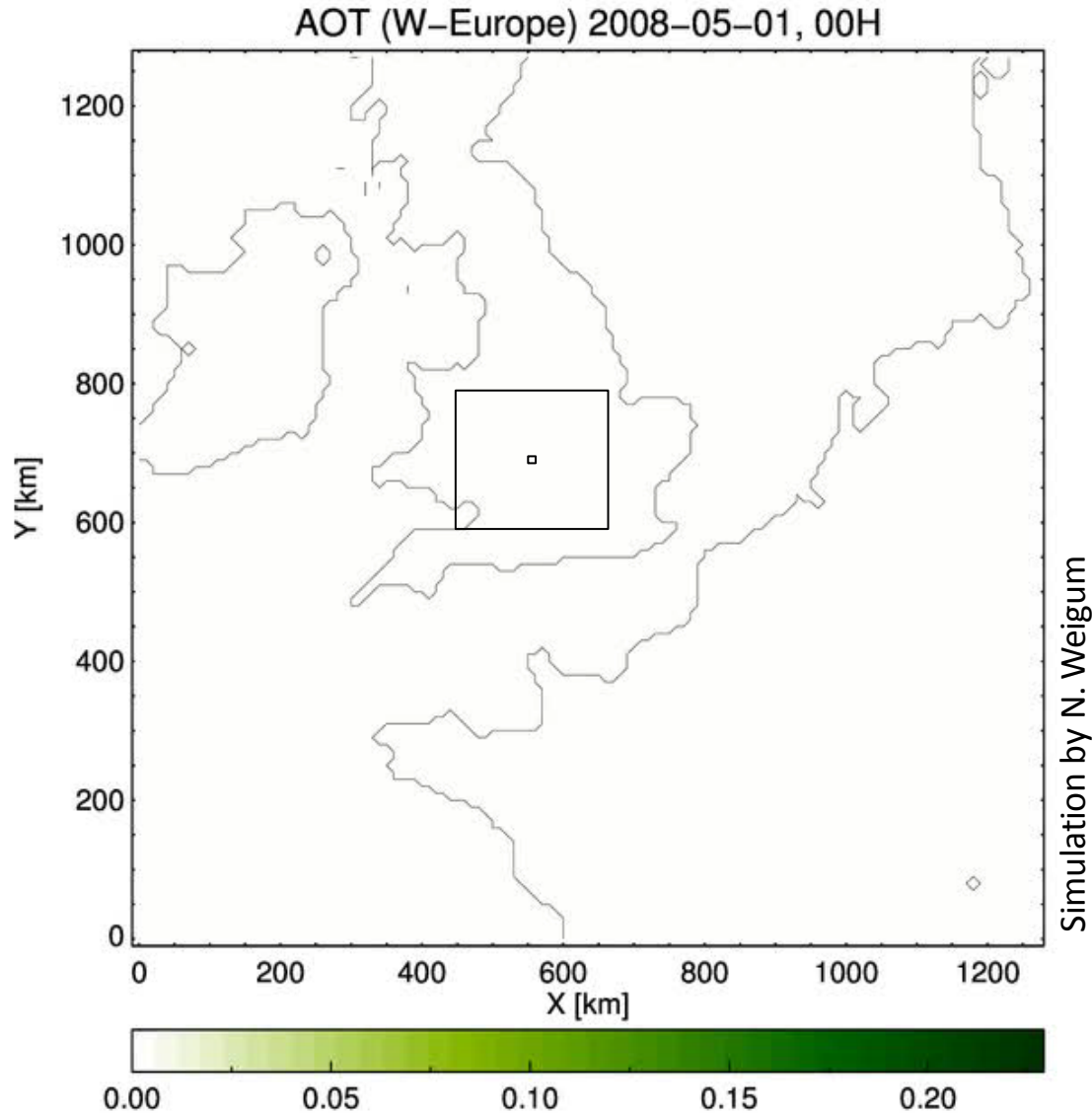


Correlations between daily model AOT and model AOT at overpass of MODIS Aqua

A day is defined by UTC



Representativeness of observations

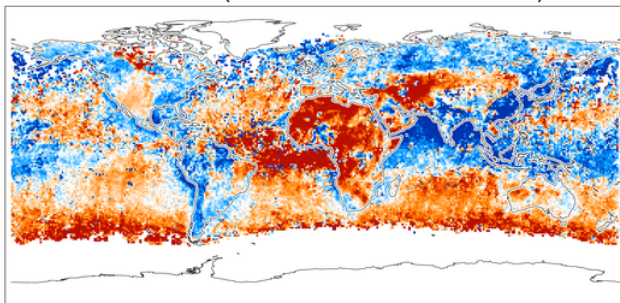


Schutgens et al ACP 2016b
Schutgens et al *in prep*

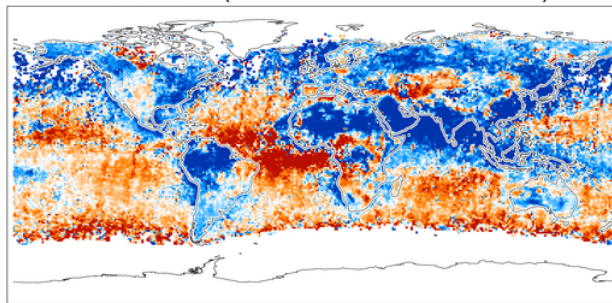
Basic idea

- Ask remote sensing groups to provide aggregated product ($1^\circ \times 1^\circ \times 30^{\text{min}}$)
- Ask model groups to provide high-frequency output (3^{hr}) of AOT, AE, SSA for **CTRL** run
- Collocate and analyse datasets
 - CIS tool poster: www.cistools.net

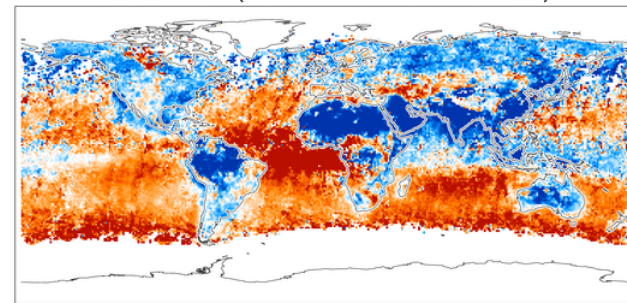
Abs diff AOD (ECHAM-HAM vs AATSR-FMI)



Abs diff AOD (ECHAM-HAM vs AATSR-RAL)

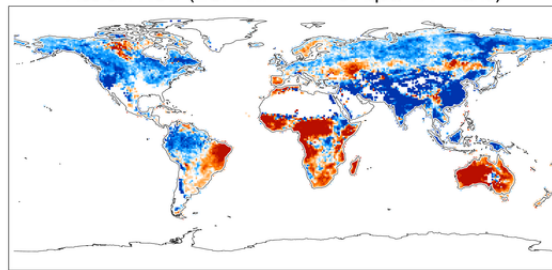


Abs diff AOD (ECHAM-HAM vs AATSR-SU)

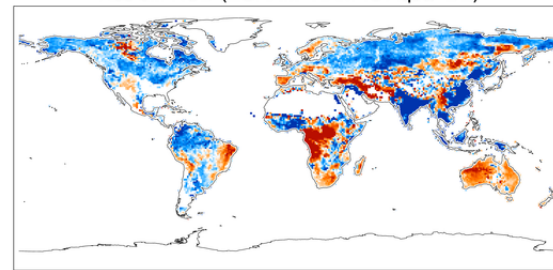


-0.10 -0.05 0.00

Abs diff AOD (ECHAM-HAM vs Aqua-DT-Land)

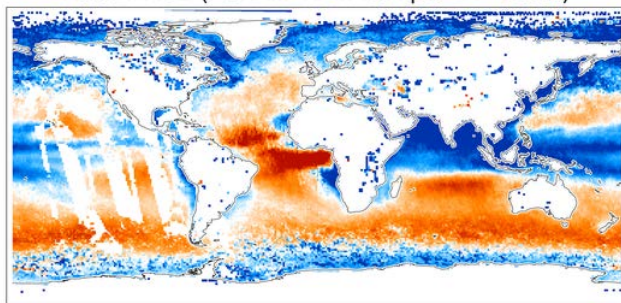


Abs diff AOD (ECHAM-HAM vs Aqua-DB)



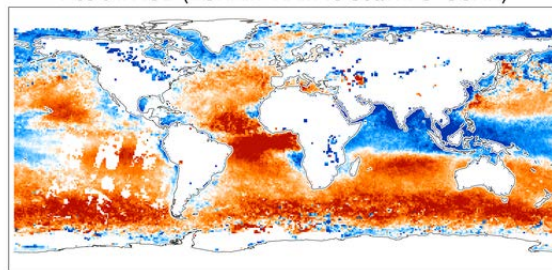
0.05 0.10 0.00 0.05 0.10

Abs diff AOD (ECHAM-HAM vs Aqua-DT-Ocean)



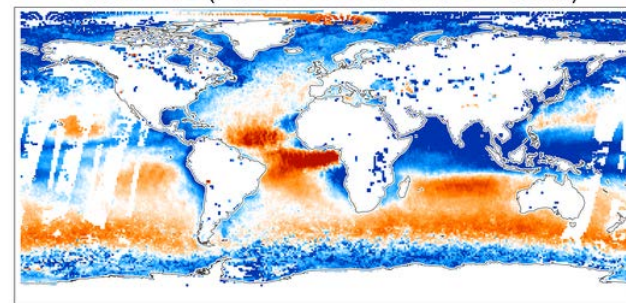
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Abs diff AOD (ECHAM-HAM vs SeaWiFS-SOAR)

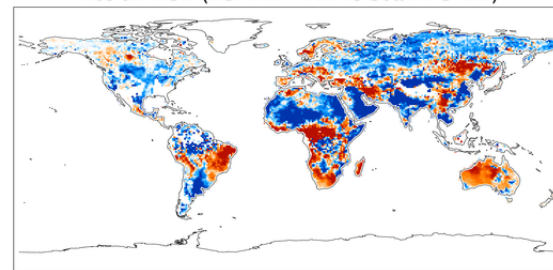


-0.10 -0.05 0.00 0.05 0.10

Abs diff AOD (ECHAM-HAM vs Terra-DT-Ocean)

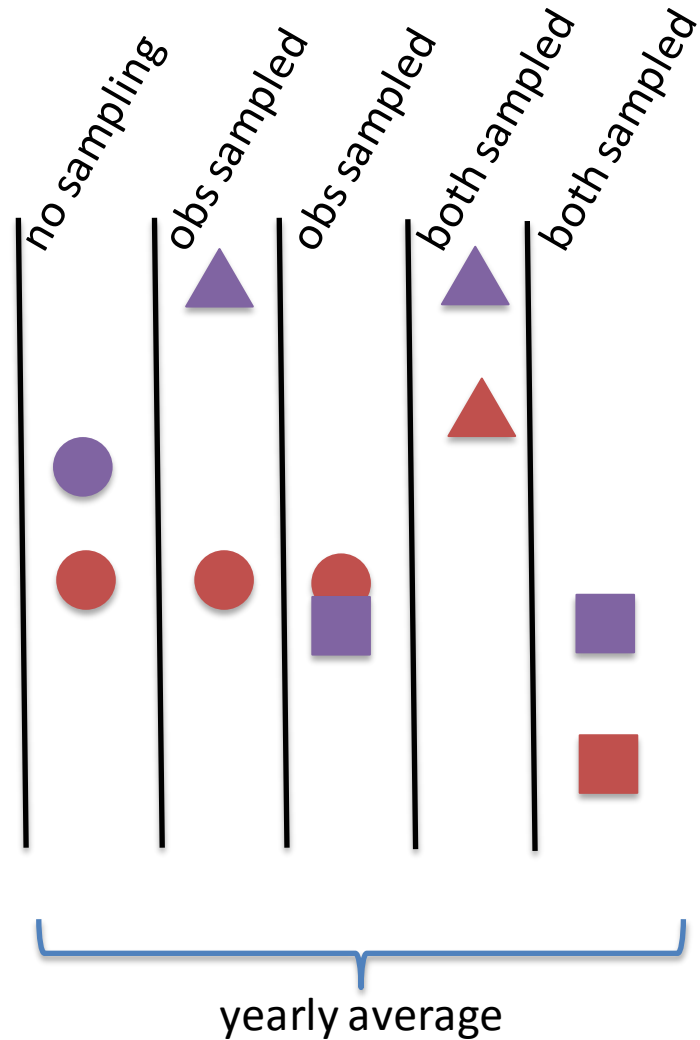
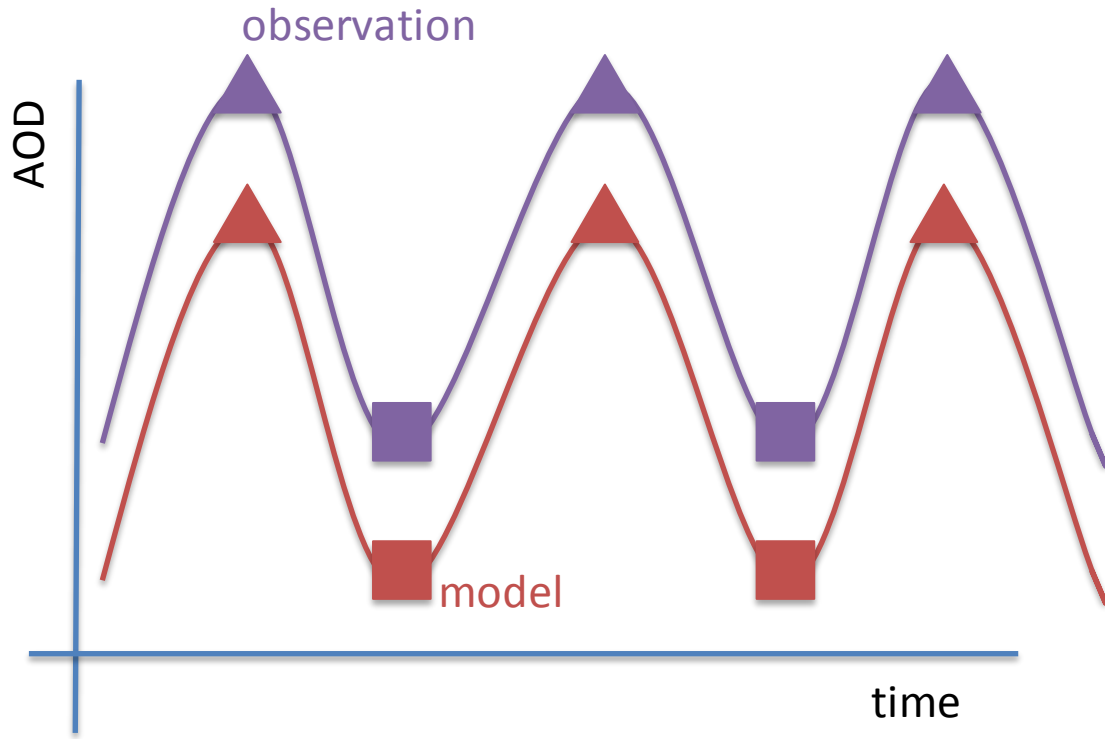


Abs diff AOD (ECHAM-HAM vs SeaWiFS-DB)



-0.10 -0.05 0.00 0.05 0.10

Impact of sampling



Summary

- At least two papers planned
 - comparison of remote sensing data
 - evaluation of AEROCOM models
- Data will be made available at some point
 - track AEROCOM model development
- Required extra model output for CTRL:
 - 3-hourly od550aer, abs550aer, od550dust, od550lt1aer, **dry od550aer**, RH
 - req. document available

Impact of sampling

