Remote sensing evaluation of AEROCOM models

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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

Sampling error

Model error

Schutgens et al ACP 2016a
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.

Schutgens et al. ACP 2016a
Representativeness of observations

AOT (W–Europe) 2008–05–01, 00H

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 ($3^{\text{hr}}$) of AOT, AE, SSA for CTRL run

• Collocate and analyse datasets
  – CIS tool poster: www.cistools.net
Impact of sampling

AOD

observation

model

no sampling
obs sampled
obs sampled
both sampled

yearly average
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

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model

time

yearly average

no sampling

obs-sampled

both sampled

both sampled

yearly average