

Understanding the top-of-atmosphere flux difference between AeroCom Phase III models and the CERES product: clear-sky perspective

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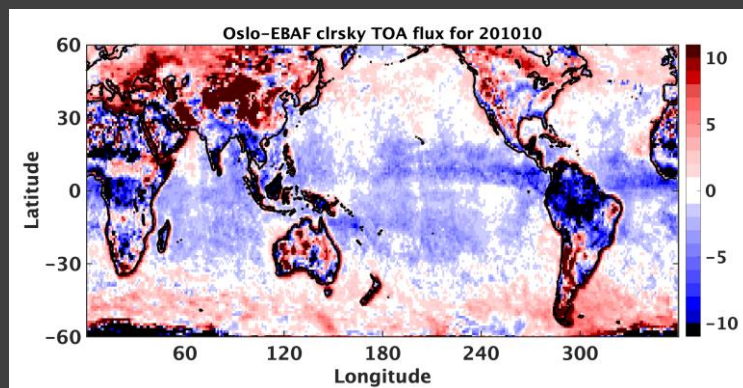
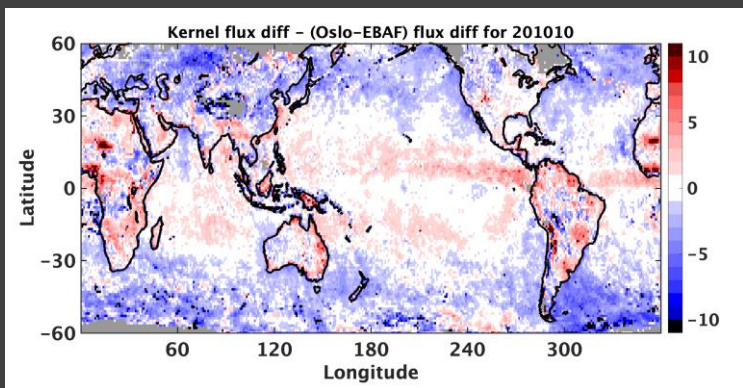
2. Science Systems & Applications Inc., Hampton, VA

Observational data used to compare with the AeroCom models

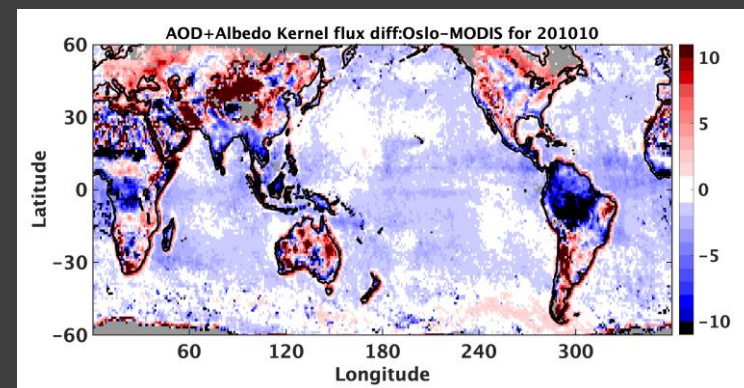
- CERES Ed4.1 TOA Energy Balanced and Filled (EBAF) data: clear-sky reflected TOA SW flux
- MODIS Aqua collection 6.1 dark target and deep blue combined AOD
- MISR V032 Level 3 AOD
- MODIS black and white sky surface albedo → blue-sky surface albedo over land
- CERES Ed4.1 surface EBAF data → clear-sky surface albedo over ocean

	AOD	TOA ↓ SW Flux	TOA ↑ clear- sky flux	Surface ↓ SW flux	Surface ↑ SW flux
OsloCTM3v1.01-met2010	✓	✓	✓	✓	✓
SPRINTARS_AP3-CTRL	✓	✓	✓	✓	✓
INCA_AP3-CTRL	✓	✓	✓	✓	✓
GFDL-AM4-met2010_AP3-CTRL	✓	✓	✓	✓	✓
GFDL-AM4-fsST_AP3-CTRL	✓	✓	✓	✓	✓
ECHAM6.3-HA2.3-met2010_AP3-CTRL	✓	✓	✓	✓	✓
CAM5-ATRAS_AP3-CTRL	✓	✓	✓	✓	✓
GISS-ModelE2p1p1-OMA_AP3-CTRL	✓		✓	✓	✓

AOD and surface albedo differences can explain most of the clear-sky flux difference

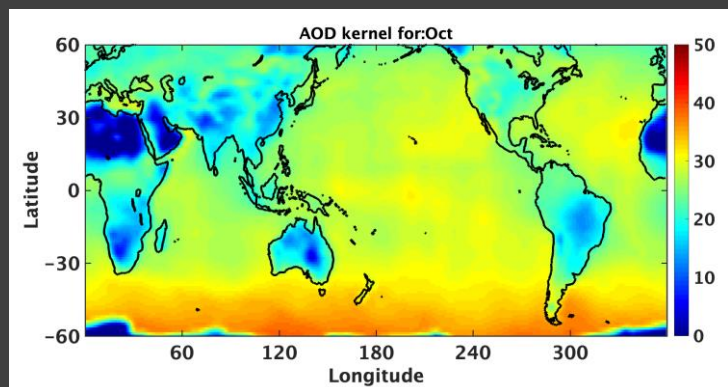


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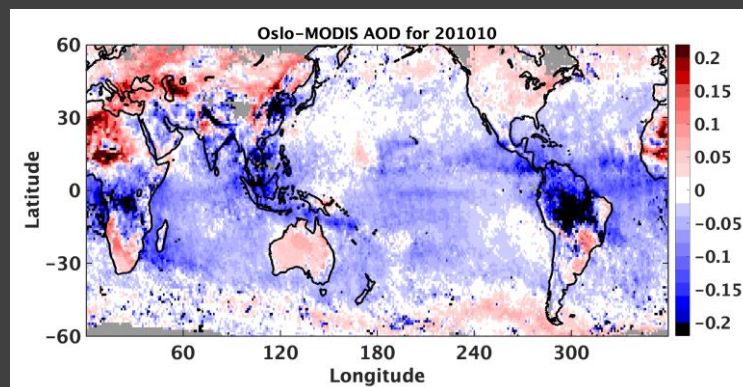


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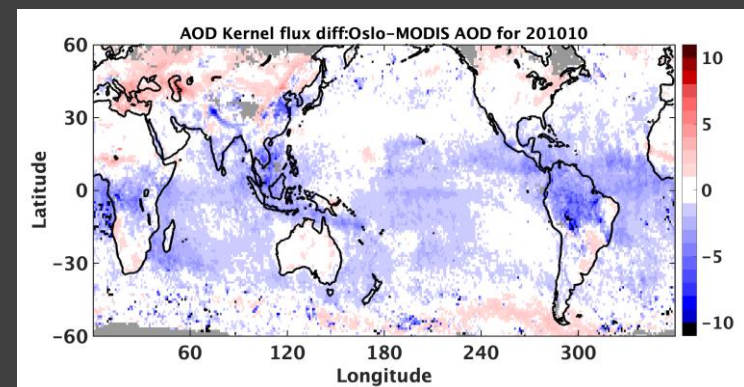
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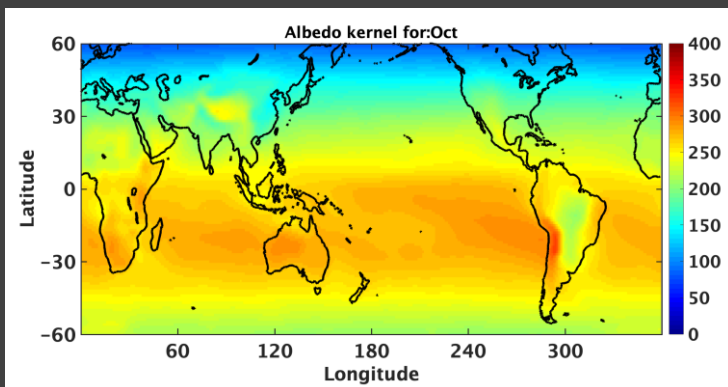
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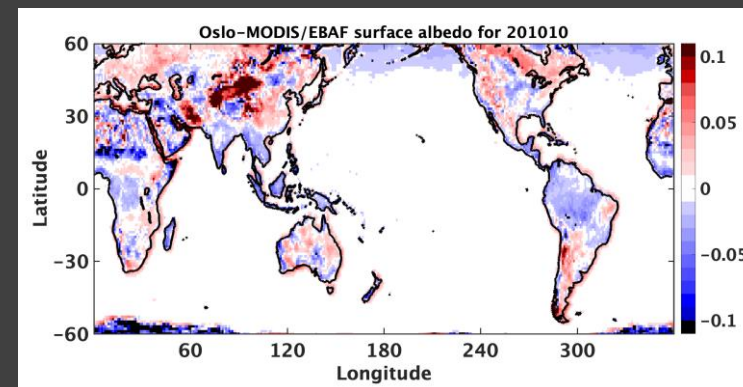
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