'Multi-satellite combinations and some SSF and SRBAVG analyses'

Michel Viollier, Patrick Raberanto, Robert Kandel

Laboratoire de Météorologie Dynamique
CNRS, Ecole Polytechnique
Palaiseau, France
- validation of Polder-2 NB-BB conversion with CERES/Terra and GERB and related SW anisotropy studies

- Megha-Tropiques preparation: comparisons of SSF LW flux and ‘pseudo-absorptance’ method

- SRBAVG – Mars 2000 – Assessment of geo-interpolation beta-1 Version
Polder-2 & Ceres-Terra (1/3)

CERES, FM1

Polarization and Directionality of the Earth's Reflectances.

First Polder-2 data
Feb, 1st, 2003

http://smsc.cnes.fr/POLDER/

May 2003

CERES STM
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POLDER-2 & CERES/Terra 2003, Feb. 9 (2/3)

POLDER-2
http://smsc.cnes.fr/POLDER/

CERES FM-1
SW radiance
for VZA<65°

Data: NASA Langley Research Center Atmospheric Sciences Data Center
Graph: LMD

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Polder-2 and CERES/Terra (3/3)

- Terra Ascending Node: 22:30 (solar local time)
- Adeos-2 Ascending Node: 22:20 (solar local time)
- Altitude ADEOS-2: 803 km; Terra: 705 km
- Cycle ADEOS-2: 4 days; Terra: 16 days
- Almost coincident data are expected several days / months
- Coincident data with GERB
- First Polder-2 data: 2003 Feb. 1\textsuperscript{st}
- Other sparse data have been recorded (i.e. March 19-22)
- Continuous record started from April 2nd
Megha-Tropiques (1/2)

- Indo-French project on water cycle and energy exchanges in the tropical regions
- 2 microwave passive instruments + ScaRaB
- severe threats of total cancellation since Nov 2002 due to CNES financial problems
- PI’s support campaign (thanks for many international contributions)
- CNES science programs committee (April 10): recommendation to continue, but with a ‘new definition’ (with lower budget) → delays and possible ScaRaB cancellation
- CNES steering committee (April 30): conclusion not known when we write

- preparation studies have continued, ex. use of the IRW and visible ScaRaB channels for improving instantaneous flux and comparisons with CERES SSF
Megha-Tropiques  ScaRaB/SSF study example (2/2)

CERES LW AEF (anisotropy emis. f.) as function of pseudo-absorptance, clear-sky scenes, CERES/SSF 9th March 1999, UT 01-09.

Method: Stubenrauch et al (JAM, 1993) applied to LW and WIR CERES channels

In red: the theoretical parametrization

Clear sky: good agreement
All-sky: need more studies

Preliminary results agree with N. Loeb and K. Loukachine

(From C. Standfuss - Noveltis)
Terra Beta1 version - CERES-SRBAVG:
GEO minus non GEO interpolation

Geo. Sat. boundary effect?
SW Monthly Means Computations with Meteosat-5

- estimate instantaneous fluxes from Meteosat-5

- average the fluxes (2.5°x2.5°) and fill the 24x31 day-hour table (applying cos SZA corrections between observation time and local half-hour, eliminating spurious data, twilight and night-time data)

- use the ERBE-type code, with CERES flux estimates

- use the GEO observed diurnal albedo variation shape in place of the ERBE modeled albedo
SW Impact: comparisons between our ‘Indoex Meteosat-5’ computations and SRBAVG

Max
+16
Around Seychelles

Min
-20
ocean west of Austr.

CERES+Meteosat 5 - Hourly Albedo = mean from 24 Meteosat slots, no interpolation at half-hours; Interpolation through 48 slots to be done

SRBAVG/CERES
Ocean W of Australia, dominant morning cloud

Meteosat-5 Mar 2000 SRBAVG beta 1

Meteosat: 2.5° region
SRBAVG: 3x3 1° region

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Seychelles, dominant afternoon cloud

Meteosat - 2.5° region
SRBAVG: 3x3 1° region

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Geo - Non Geo Interpolation (SRBAVG)
20S-20N Mean (and global mean) Wm\(^{-2}\)

<table>
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<th>Month</th>
<th>LW</th>
<th>SW</th>
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<td>PFM, Ed 2b</td>
<td>Jan 1998</td>
<td>+0.30</td>
<td>-0.94</td>
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<tr>
<td></td>
<td>Fev 1998</td>
<td>-0.53</td>
<td>-0.06</td>
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<td></td>
<td>Mar 1998</td>
<td>-0.31</td>
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<tr>
<td></td>
<td>Apr 1998</td>
<td>+0.26</td>
<td>-0.77</td>
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<tr>
<td></td>
<td>May 1998</td>
<td>-0.43</td>
<td>0.09</td>
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<tr>
<td></td>
<td>June 1998</td>
<td>-0.15</td>
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<tr>
<td></td>
<td>Aug 1998</td>
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<td>-1.07 (-0.61)</td>
<td>+5.98 (+2.72)</td>
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<td>Jan 2001</td>
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<td>+8.99 (+4.81)</td>
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<td>FM2 beta2</td>
<td>Apr 2001</td>
<td>-1.15 (-0.78)</td>
<td>+3.78 (+2.02)</td>
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</tbody>
</table>
TRMM : geo – non geo interp.

Tropical Means: not significant (< 1 Wm\(^{-2}\))

Regional : up to 20 Wm\(^{-2}\)

May 1999, LW

Feb 1999, SW
Comparing 2.5° and 1° grids, here: re-sampling on a common 2° grid
Large SW differences (> 20 Wm^{-2}) : impact of the new SW flux computation?

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‘geo impact’ from CERES SRBAVG
March 2000 beta1 version: conclusions

- LW: large negative impact over Africa (0° Meteosat)
- SW: some remaining anomalies apparently related to the different geostationary satellite boundaries
- dominant morning and afternoon clouds: SW impacts consistent with our ‘Indoex Meteosat-5’ computations
- impact on tropical means: not significant (< 1 Wm$^{-2}$) for TRMM; large (> 6 Wm$^{-2}$, SW) for Terra (beta1 version)
- differences between ERBE monthly means (ES9) and SRBAVG non GEO: -0.52 (LW) and 1.5 Wm$^{-2}$ (SW)
- → strong sensitivity of SW regional and zonal means to the processing steps (ES9, geo and non geo interpolation)