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

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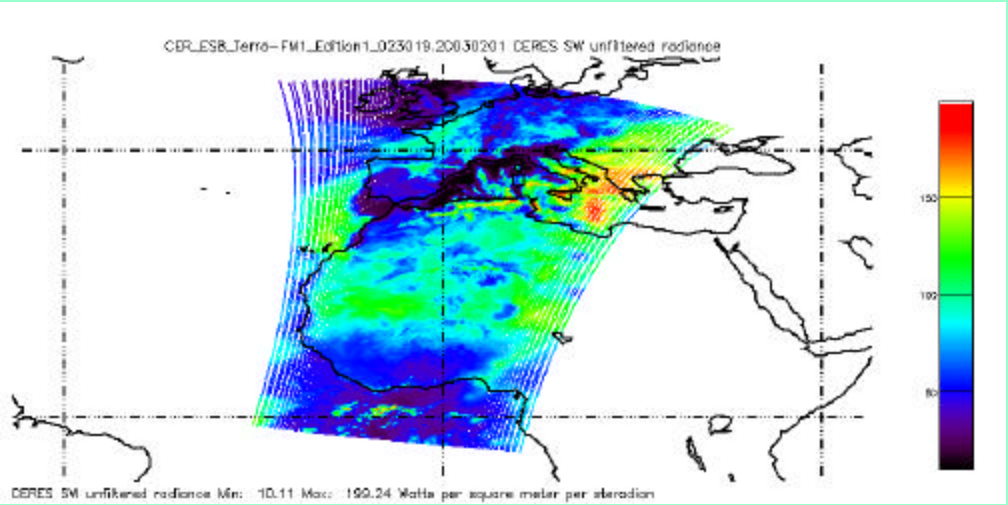
Outline

- validation of Polder-2 NB-BB conversion with CERES/Terra and GERB and related SW anisotropy studies

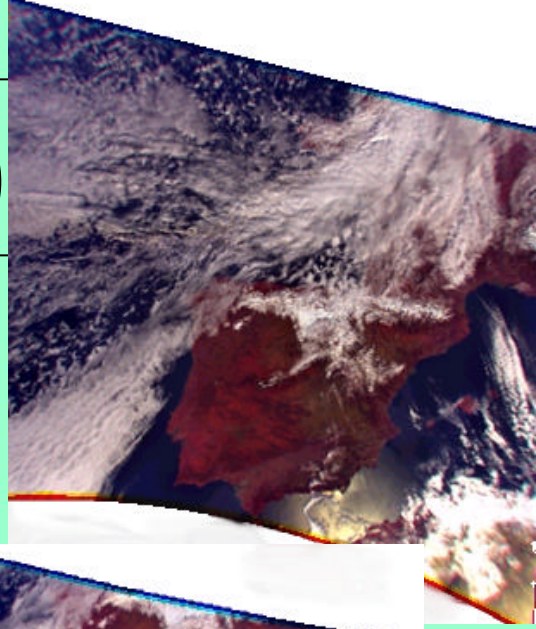
- Megha-Tropiques preparation: comparisons of SSF LW flux and ‘pseudo-absorptance’ method

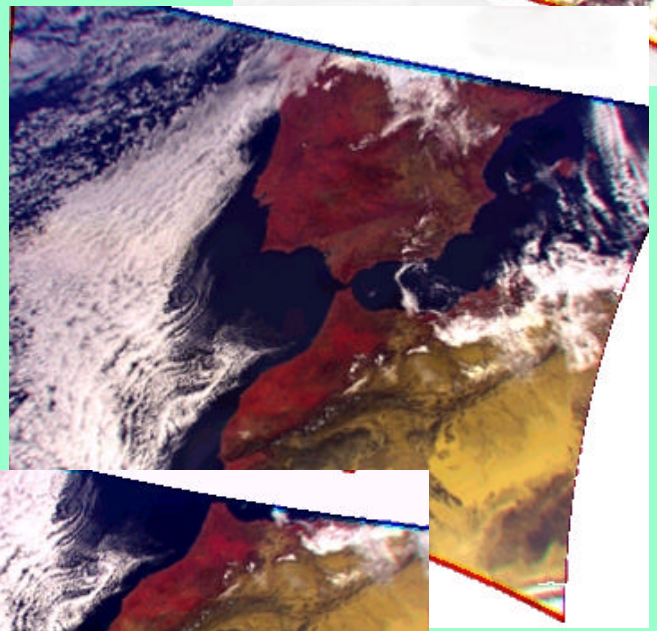
- SRBAVG – Mars 2000 – Assessment of geo-interpolation beta-1 Version

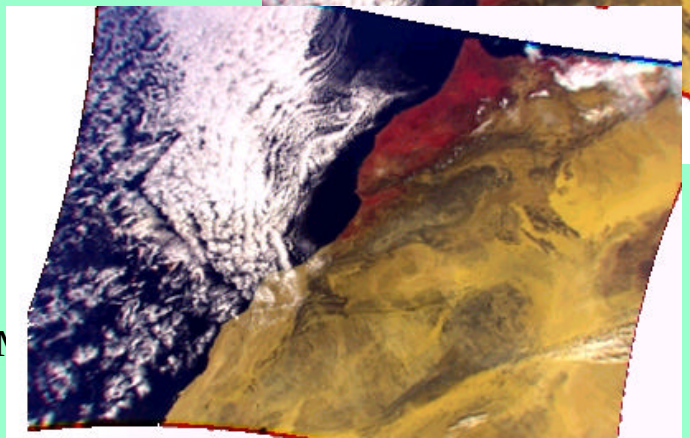
Polder-2 & Ceres-Terra (1/3)



CERES , FM1







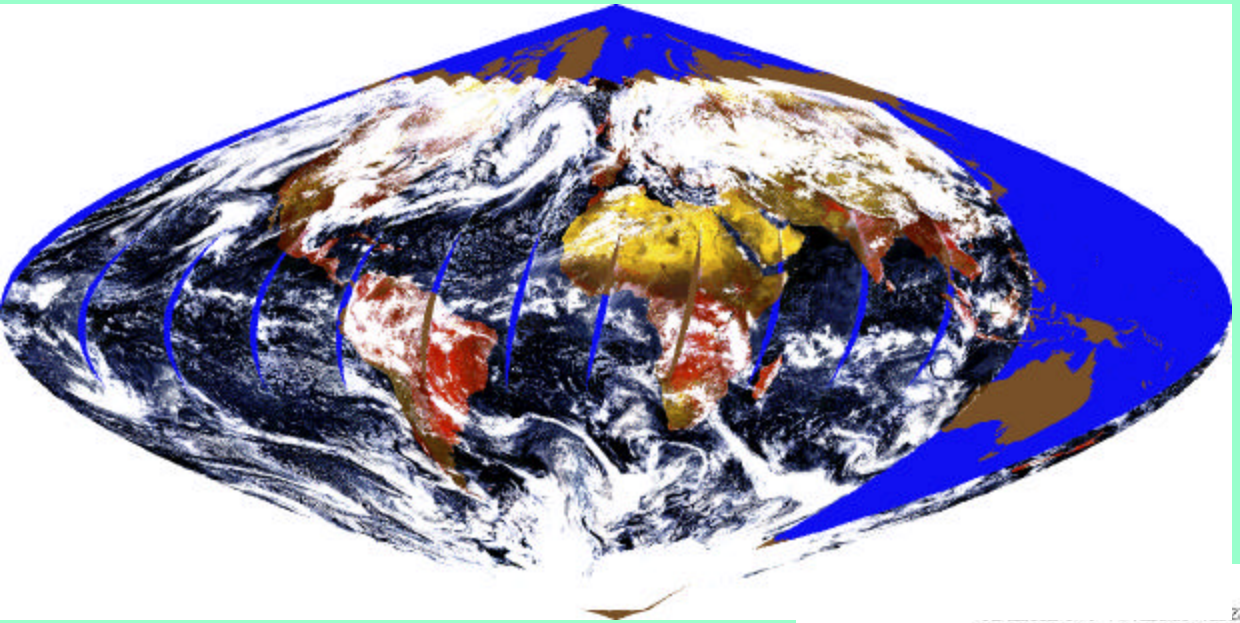
Polarization and Directionality
of the Earth' Reflectances.

First Polder-2 data

Feb, 1st, 2003

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

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

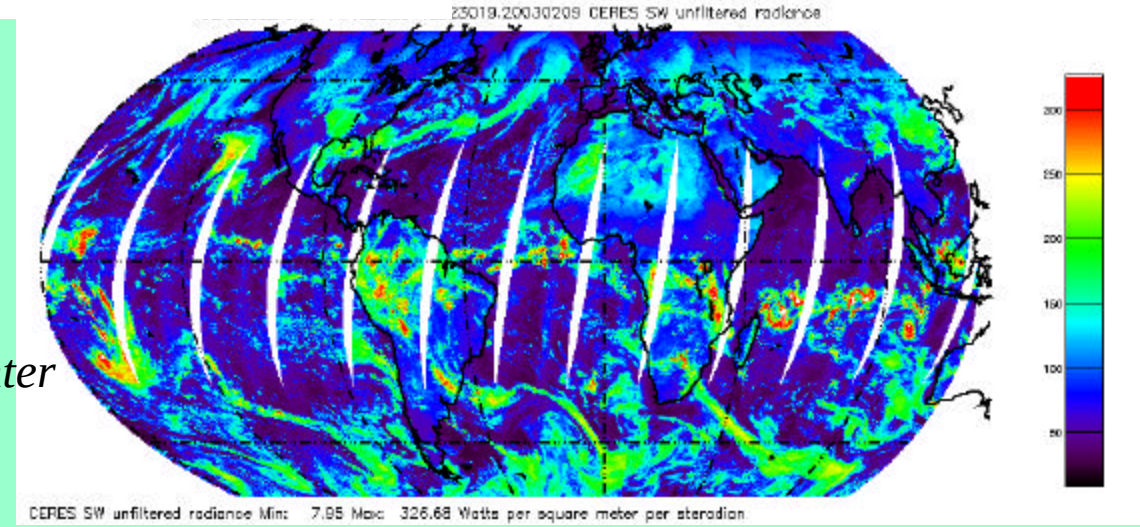


POLDER-2

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

CERES FM-1
SW radiance
for VZA<65°

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



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. 1st
- 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)

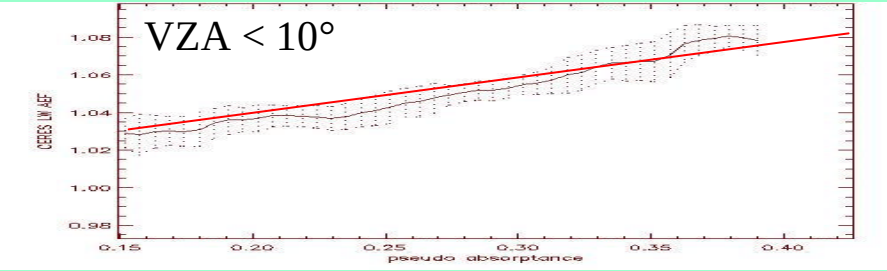
CERES LW AEF(anisotropy emis. f.)
as function of pseudo-absorptance,
clear-sky scenes,
CERES/SSF 9th March 1999, UT 01-09.

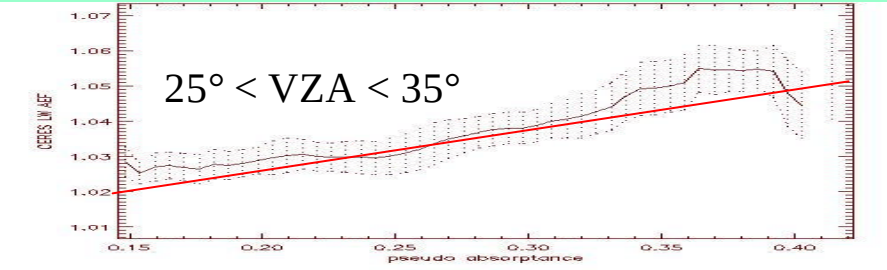
Method : Stubenrauch et al (JAM, 1993)
applied to LW and WIR CERES channels

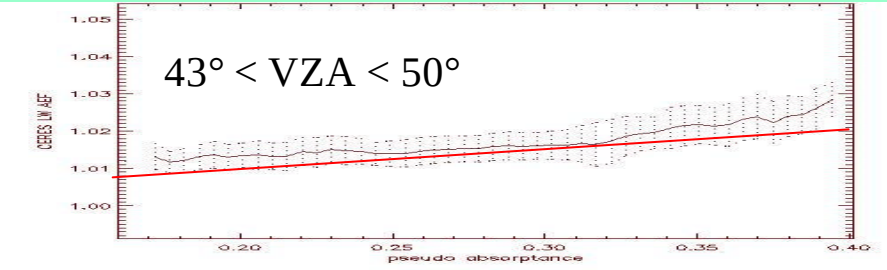
In red: the theoretical parametrization

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

Preliminary results agree with
N. Loeb and K. Loukachine

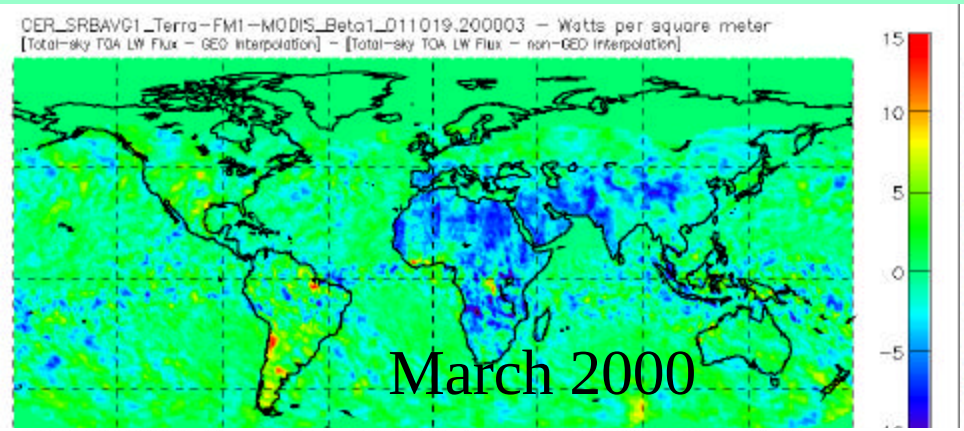


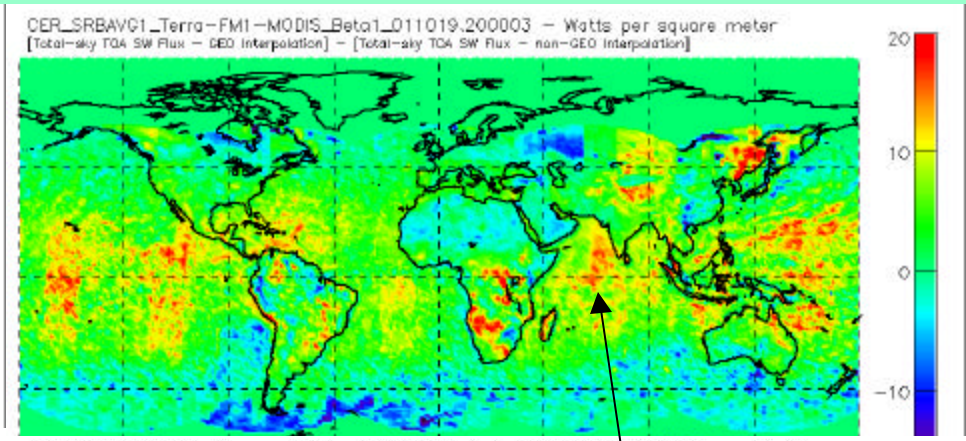


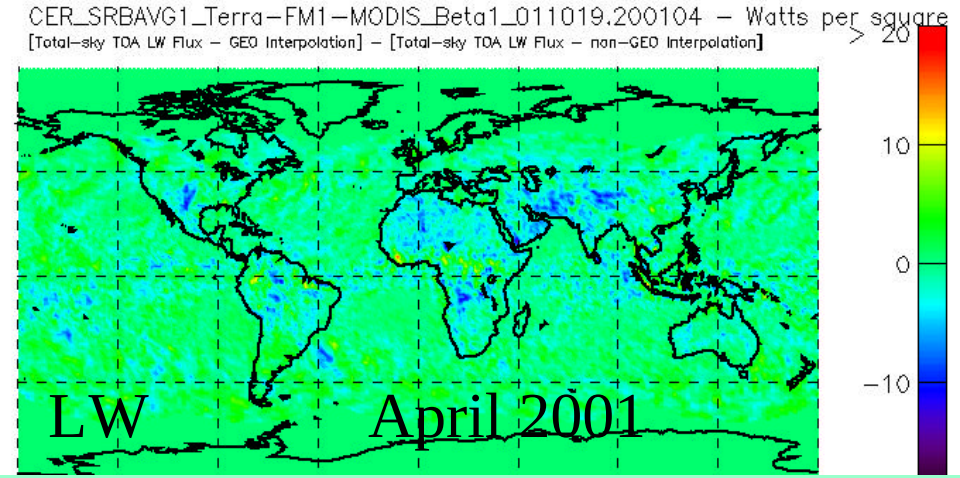


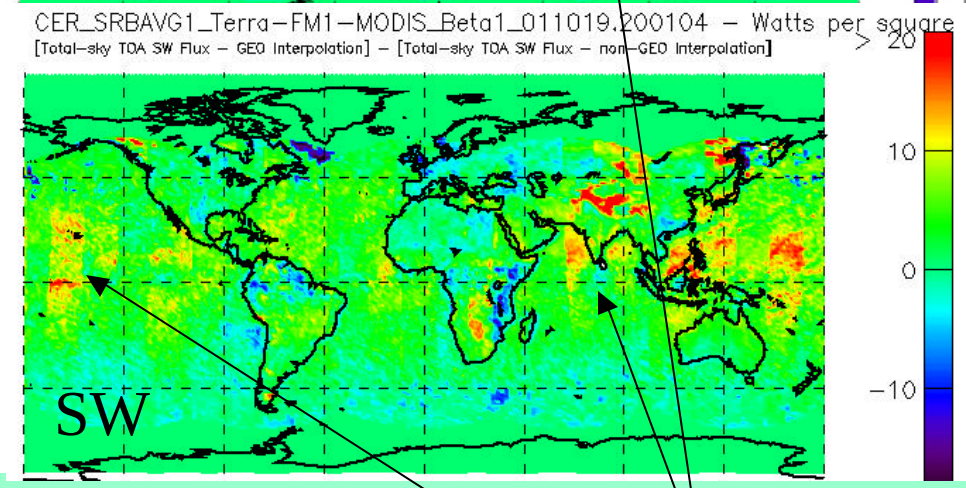
(From C. Standfuss - Noveltis)

Terra Beta1 version - CERES-SRBAVG : GEO minus non GEO interpolation





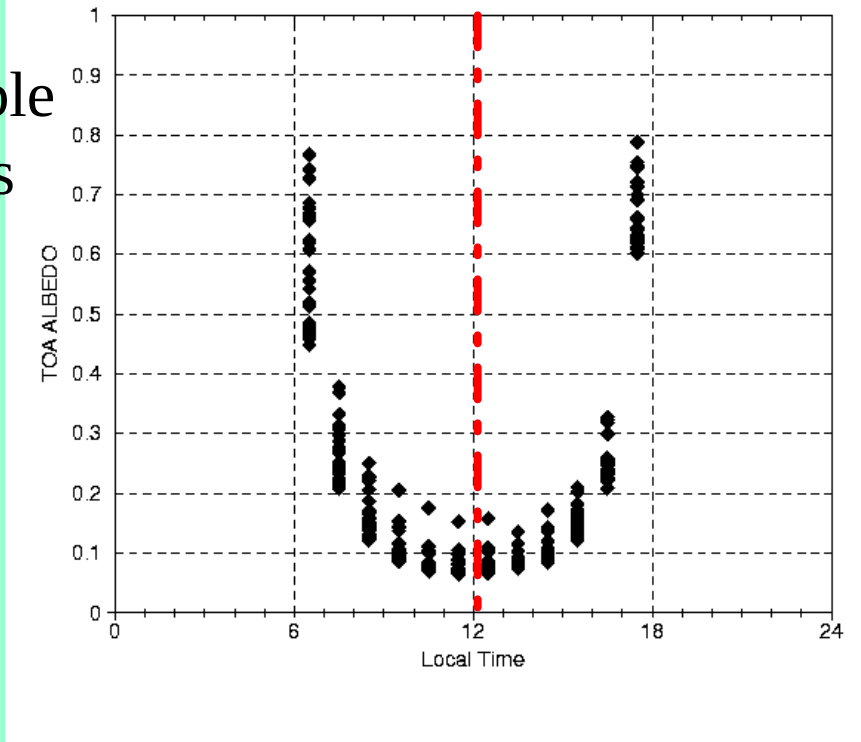




Geo. Sat. boundary effect?

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

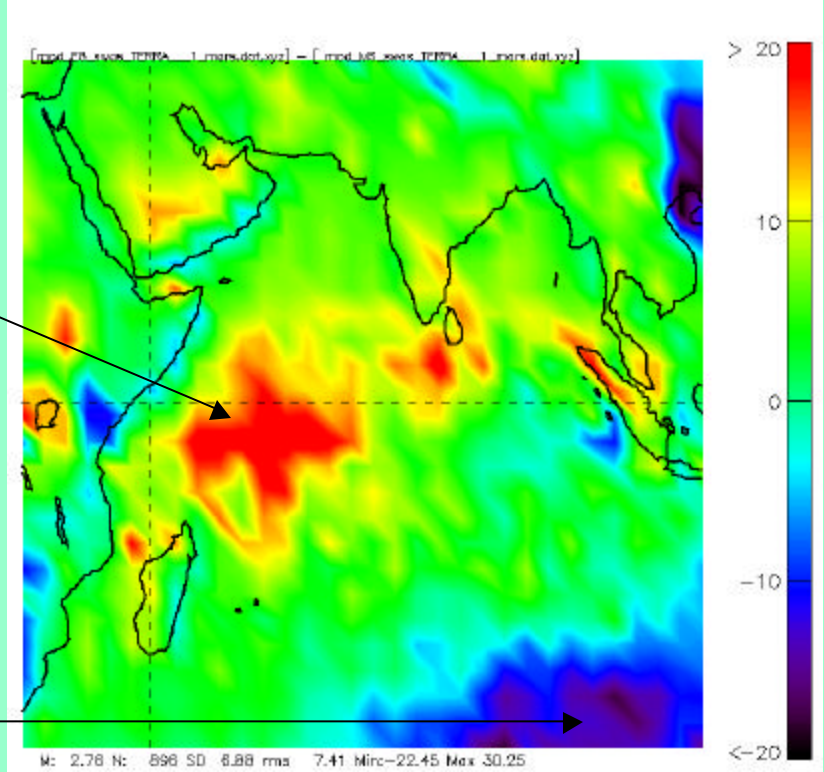


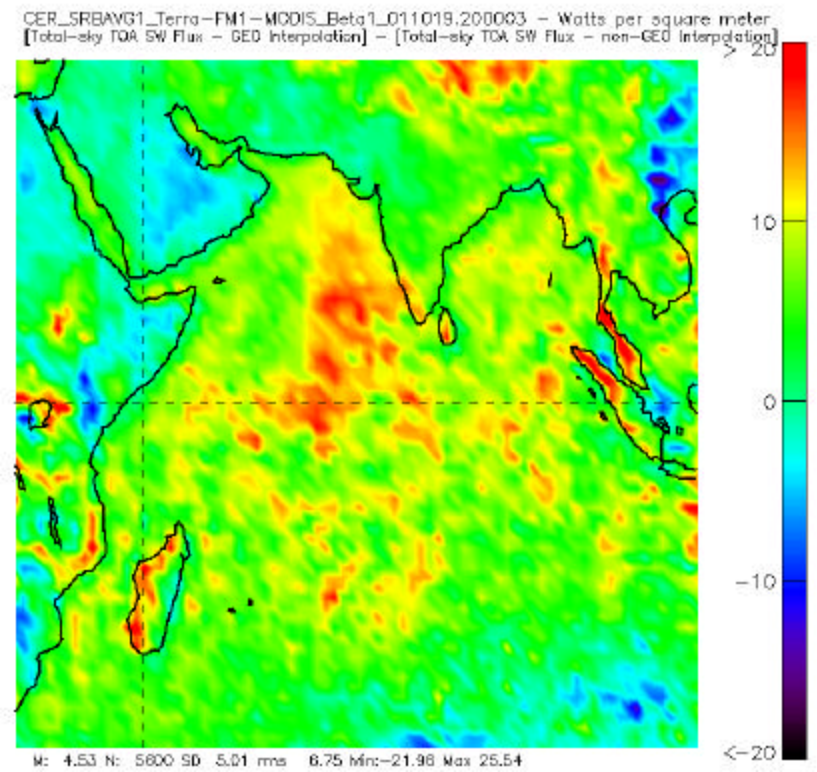
- use the GEO observed diurnal albedo variation shape in place of the ERBE modeled albedo

SW Impact: comparisons between our ‘Indoex Meteosat-5’ computations and SRBAVG

Max
+16
Around
Seychelles

Min
-20
ocean
west of
Austr.





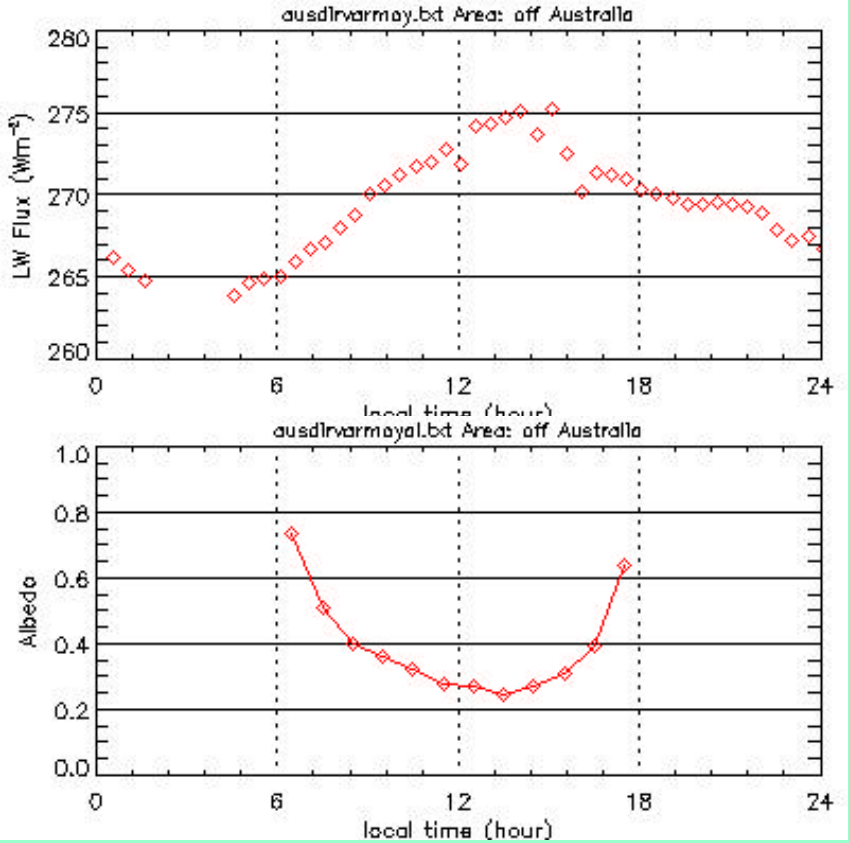
CERES+Meteosat 5 - Hourly Albedo= mean from 24 Meteosat slots , no interpolation at half-hours; Interpolation through 48 slots to be done

SRBAVG/CERES

M. Viollier, P. Raberanto, R. Kandel

Ocean W of Australia, dominant morning cloud

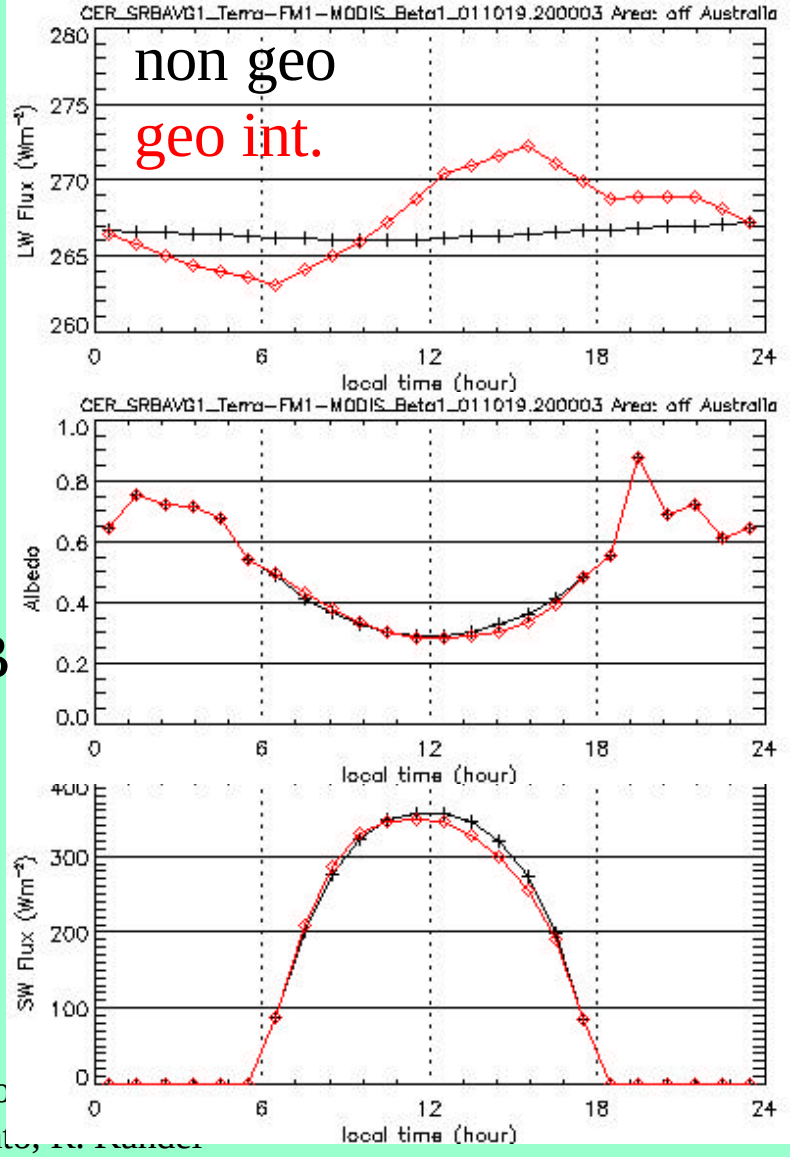
METEOSAT-5 Mar 2000 SRBAVG beta 1



LW

ALB

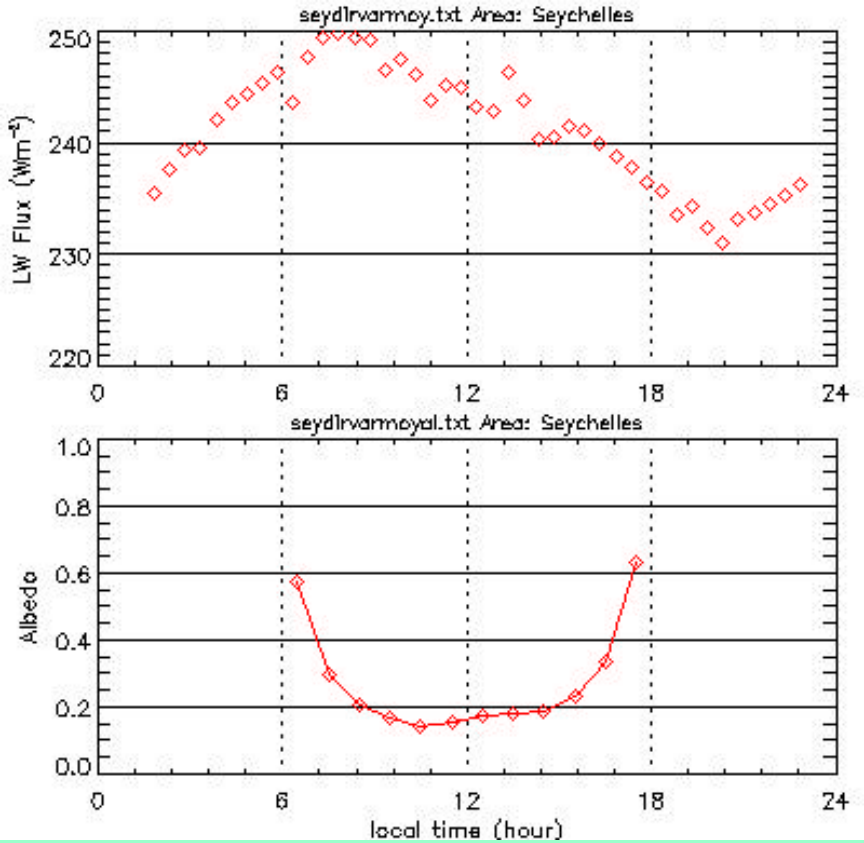
SW



Meteosat : 2,5° region
SRBAVG: 3x3 1° region

Seychelles, dominant afternoon cloud

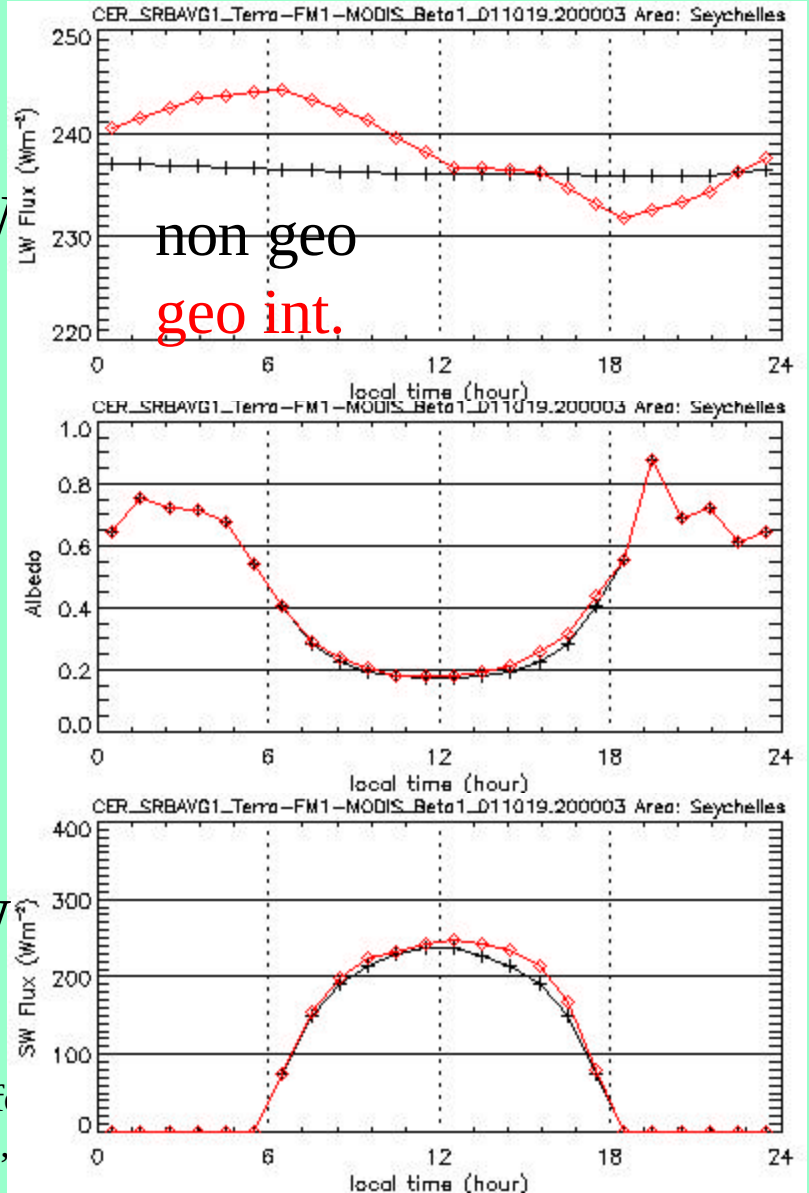
METEOSAT-5 Mar 2000 SRBAVG beta1



LW

AL

SW



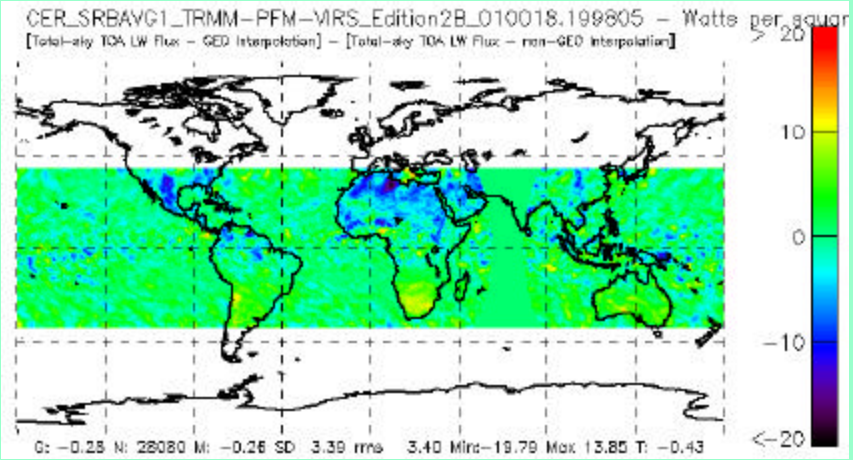
Meteosat : 2,5° region

SRBAVG: 3x3 1° region

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

	Month	LW	SW
PFM, Ed 2b	Jan 1998	+0.30	-0.94
„	Fev 1998	-0.53	-0.06
„	Mar 1998	-0.31	-0.26
„	Apr 1998	+0.26	-0.77
„	May 1998	-0.43	0.09
„	June 1998	-0.15	-0.7
„	Jul 1998		
„	Aug 1998	-0.24	+0.17
„	Mar 2000		+0.05
FM1, beta 1	Mar 2000	-1.07 (-0.61)	+5.98 (+2.72)
FM2, beta 1	Mar 2000	-1.26 (-0.70)	+6.19 (+2.80)
FM1 beta 1	Jan 2001	-1.10 (-0.42)	+8.99 (+4.81)
FM2 beta2	Apr 2001	-1.15 (-0.78)	+3.78 (+2.02)

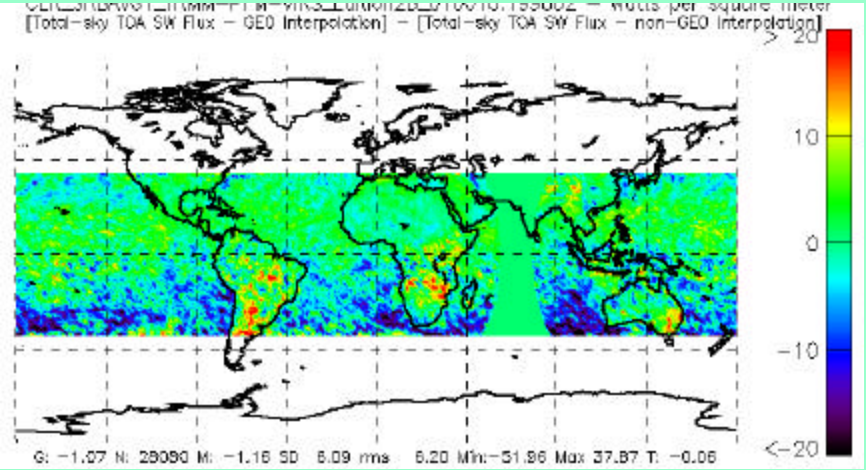
TRMM : geo – non geo interp.



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

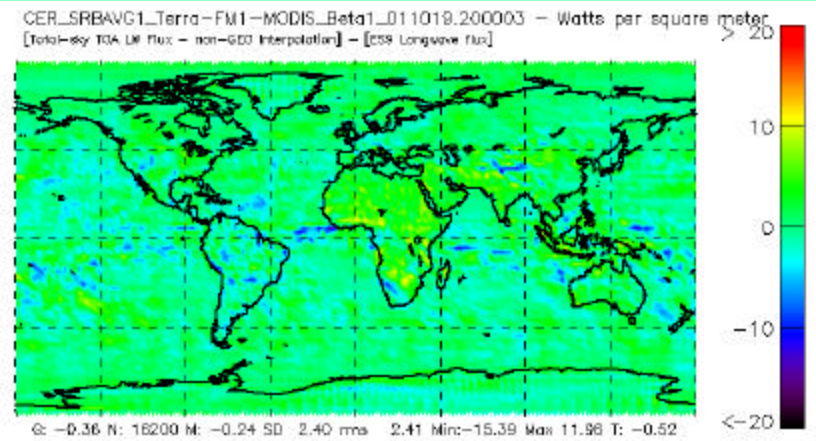
Regional : up to 20 Wm^{-2}

May 1999, LW

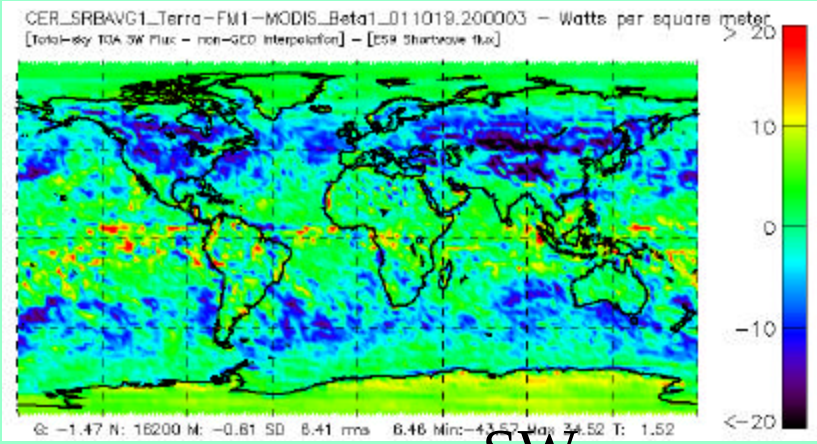


Feb 1999, SW

SRBAVG non geo minus S9



LW



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 ?

‘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)