GERB-CERES comparisons: Progress towards GERB data release

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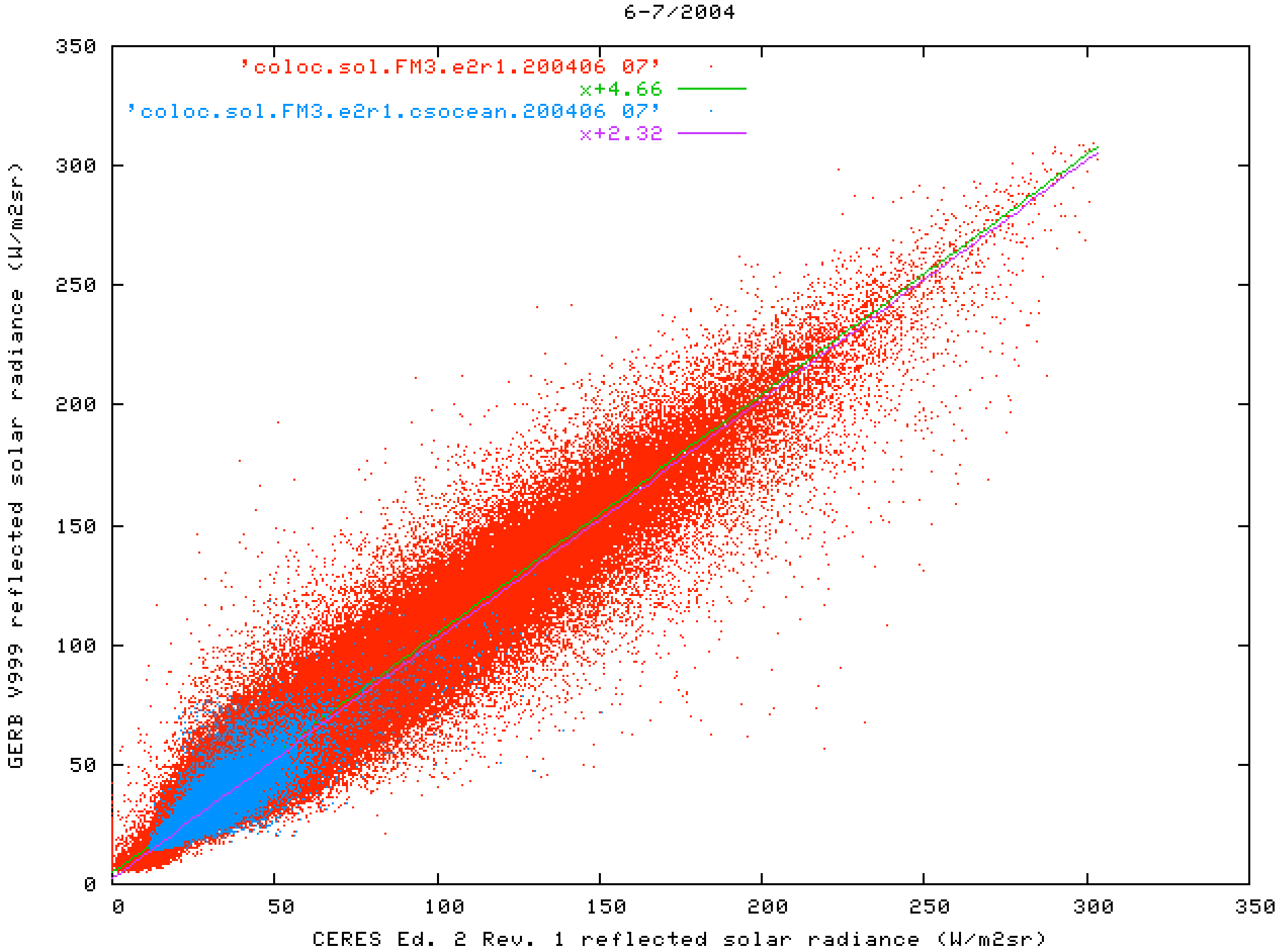
Methodology

- Unfiltered radiance comparison: validation calibration + unfiltering
  - Reflected solar radiance
  - Emitted thermal radiance: night + day
- Additional flux comparison: validation scene id + ADM
- Additional regional analysis: scene dependence differences

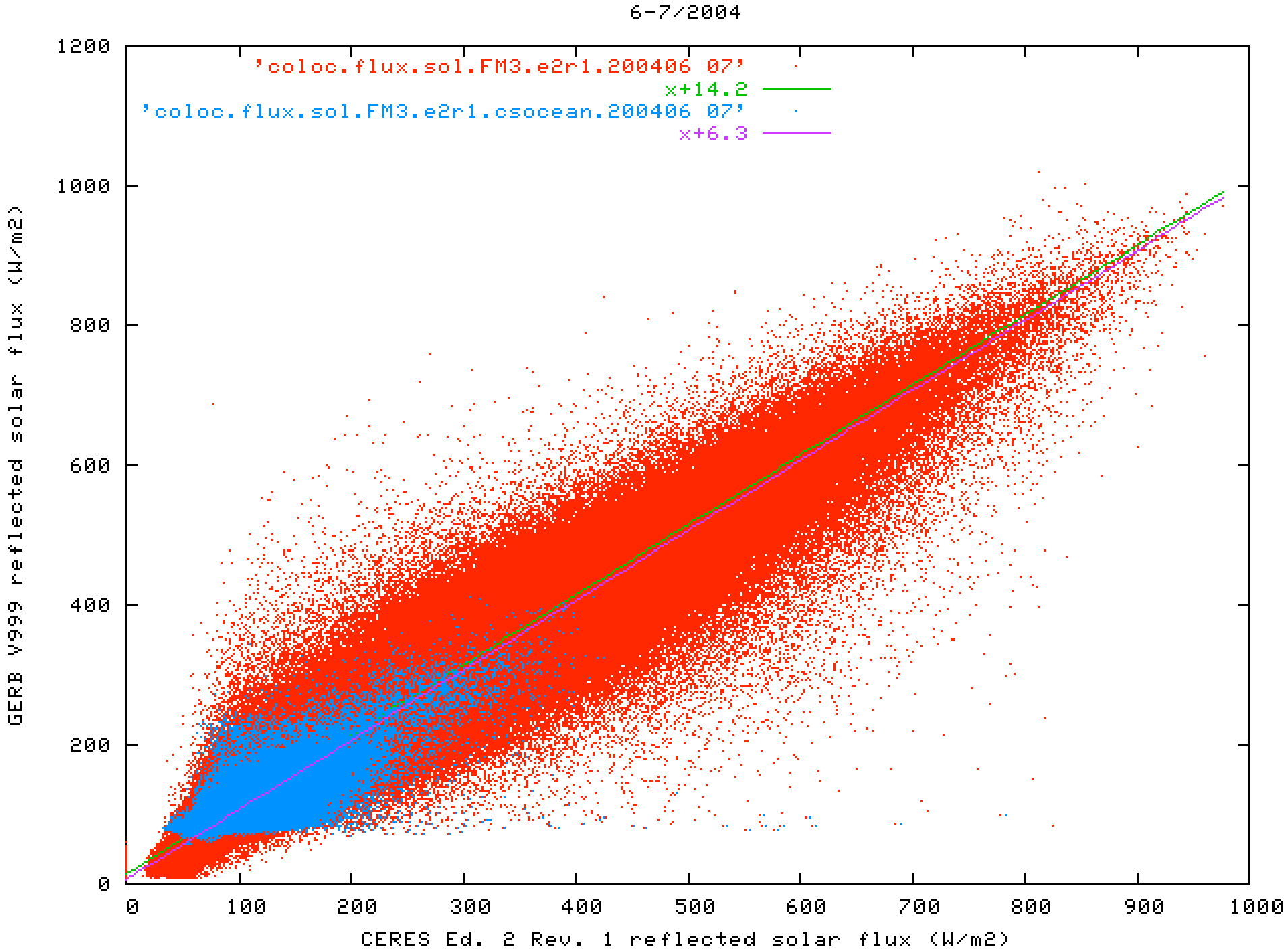
Used data

- GERB: ARG product, Version ‘999’: reprocessed version with new spectral response (mainly SW) + empirical ADM correction for thermal fluxes
- CERES FM2 and FM3: RAPS or GERB mode or special scan, ES8, Edition 2 + Rev. 1 (SW)
- 6-7/2004
- CERES data is colocated to nearest GERB ARG pixel


6-7/2004
'coloc.sol.FM3.e2r1.200406 07'
x+4.66
'coloc.sol.FM3.e2r1.csocean.200406 07'
x+2.32
GERB V999 reflected solar radiance (W/m2sr)
CERES Ed. 2 Rev. 1 reflected solar radiance (W/m2sr)
0
50
100
150
200
250
300
350

Reflected solar radiance

GERB - CERES GERB/CERES	FM2	FM3
Clear sky ocean	1.2 W/m^{2}sr 1.041 +/- 0.012	2.3 W/m^{2}sr 1.079 +/- 0.014
All sky	3.0 W/m^{2}sr 1.045 +/- 0.003	4.7 W/m^{2}sr 1.066 +/- 0.003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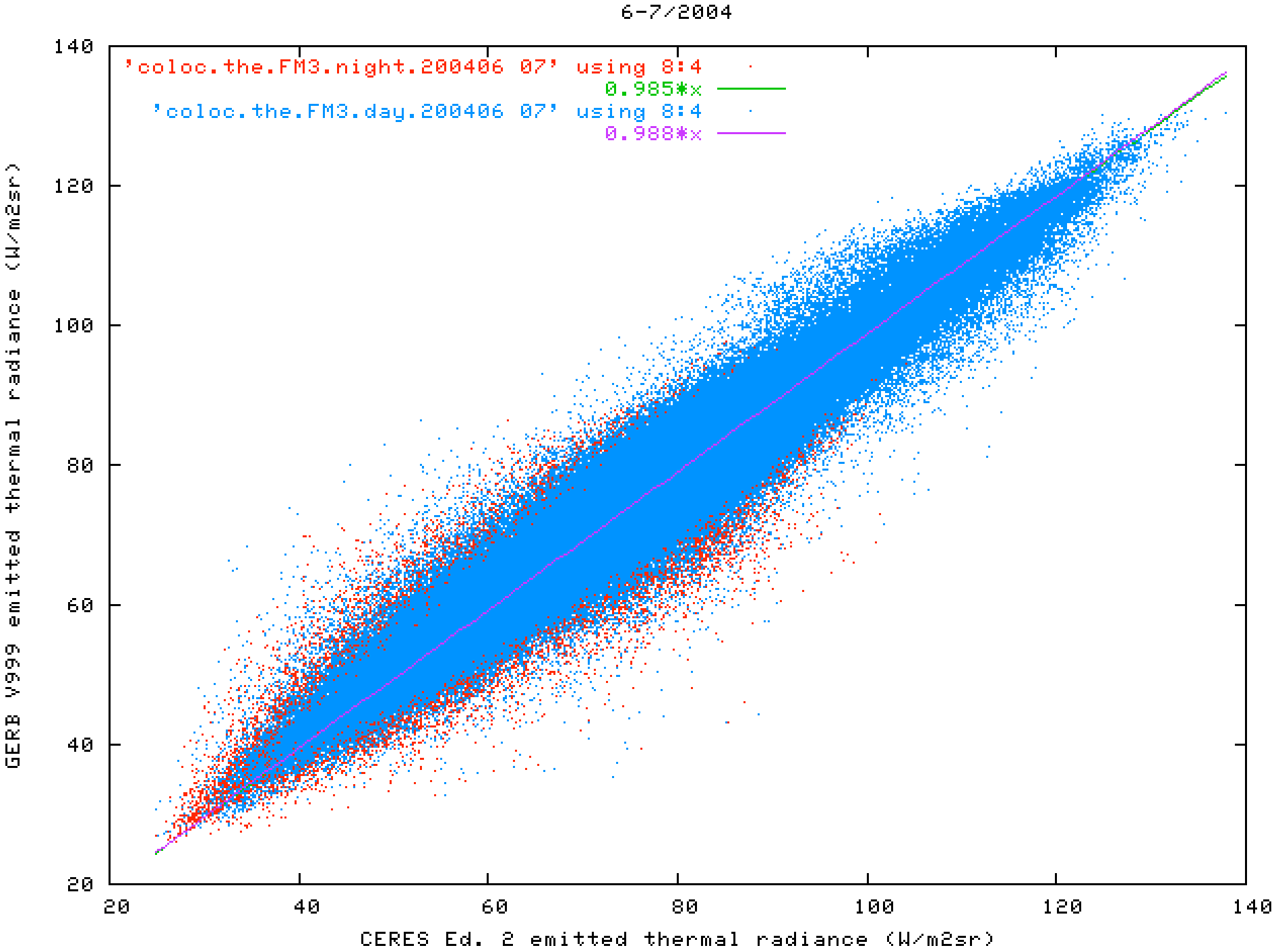
x+14.2
'coloc.flux.sol.FM3.e2r1.csocean.200406_07'
x+6.3
GERB W999 reflected solar flux (W/m2)
CERES Ed. 2 Rev. 1 reflected solar flux (W/m2)
0
200
400
600
800
1000
1200
0
100
200
300
400
500
600
700
800
900
1000

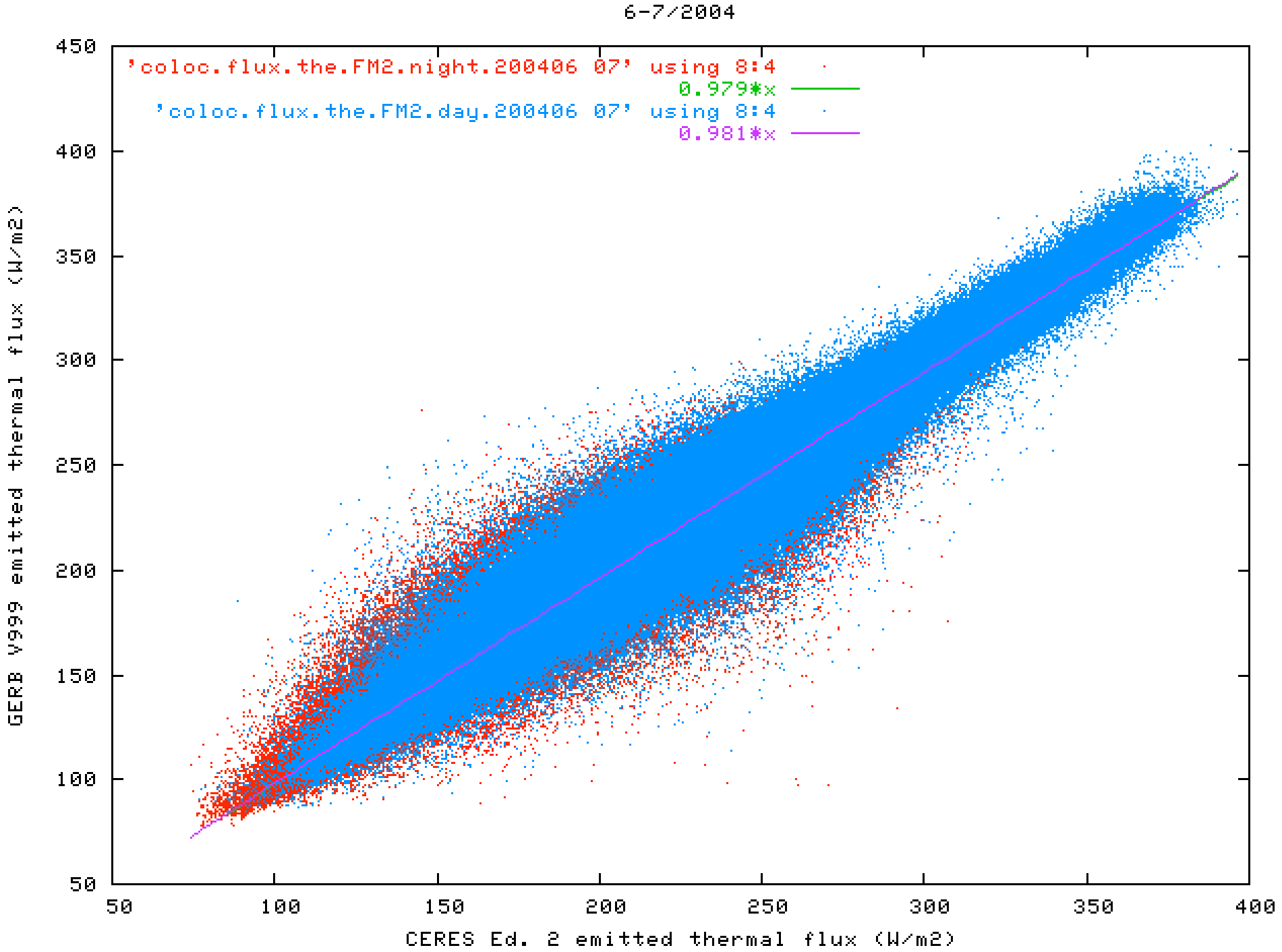
Reflected solar flux

GERB-CERES GERB/CERES	FM2	FM3
Clear sky ocean	9.6 W/m^2 1.091 +/- 0.025	6.3 W/m^2 1.060 +/- 0.029
All sky	12.6 W/m^2 1.056 +/- 0.004	14.2 W/m^2 1.064 +/- 0.002


6-7/2004
'coloc.the.FM3.night.200406 07' using 8:4
0.985*x
'coloc.the.FM3.day.200406 07' using 8:4
0.988*x
GERB V999 emitted thermal radiance (W/m2sr)
CERES Ed. 2 emitted thermal radiance (W/m2sr)
20
40
60
80
100
120
140

Emitted thermal radiance

GERB-CERES GERB/CERES	FM2	FM3
Day	0.1 W/m^{2}sr 1.001 +/- 0.003	-1.0 W/m^{2}sr 0.988 +/- 0.001
Night	-0.4 W/m^{2}sr 0.995 +/- 0.002	-1.2 W/m^{2}sr 0.985 +/- 0.001


6-7/2004
'coloc.flux.the.FM2.night.200406_07' using 8:4
0.979*x
'coloc.flux.the.FM2.day.200406_07' using 8:4
0.981*x
GERB W999 emitted thermal flux (W/m2)
CERES Ed. 2 emitted thermal flux (W/m2)
450
400
350
300
250
200
150
100
50
50
100
150
200
250
300
350
400

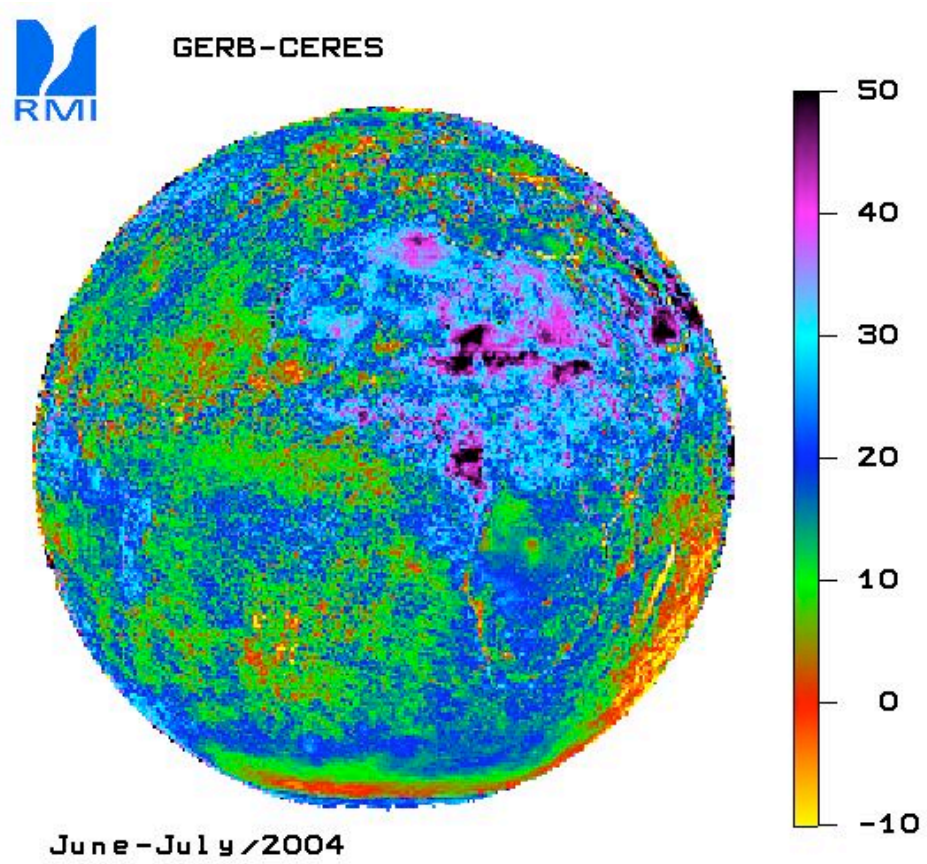
Emitted thermal flux

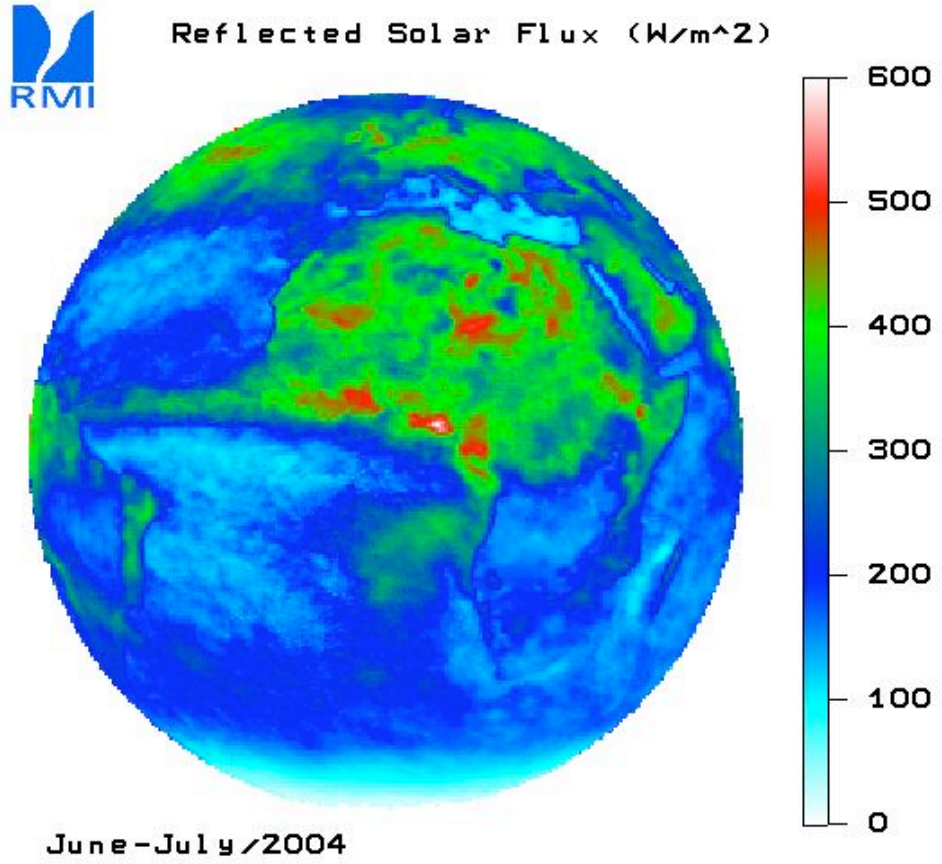
GERB-CERES GERB/CERES	FM2	FM3
Day	-3.6 W/m^2 0.986	-5.0 W/m^2 0.981
Night	-4.2 W/m^2 0.984	-5.4 W/m^2 0.979

Summary flux differences

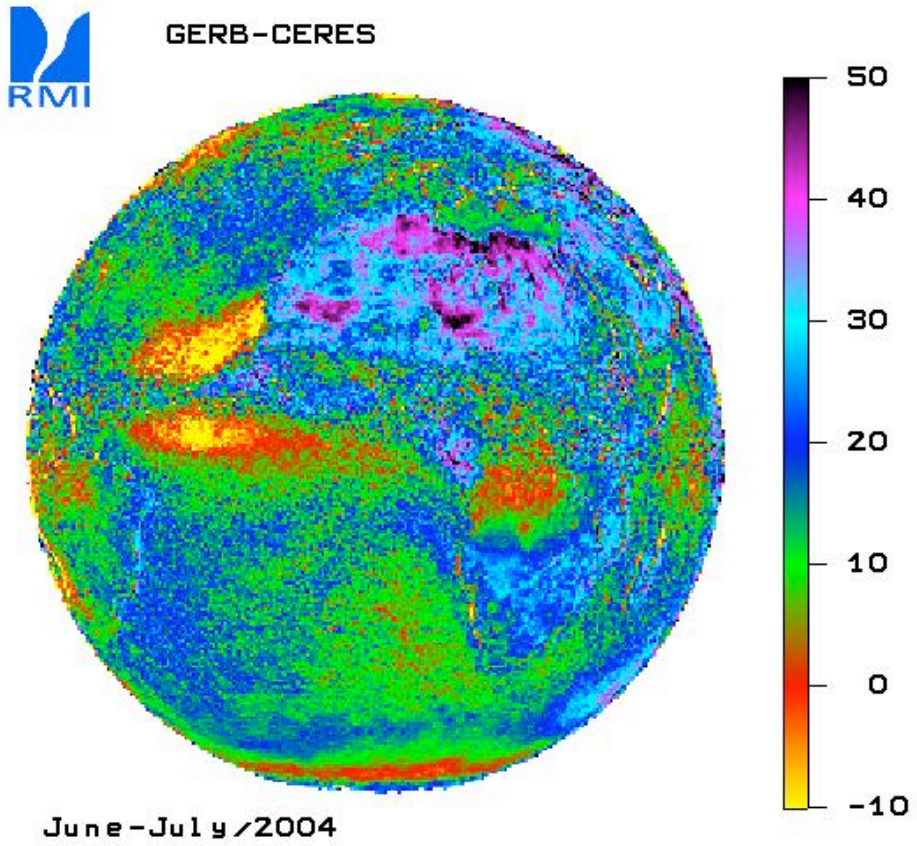
GERB-CERES	FM2	FM3
Reflected solar	12.6 W/m^2	14.2 W/m^2
Emitted thermal	-3.9 W/m^2	-5.2 W/m^2
'Net'	2.4 W/m^2	1.9 W/m^2

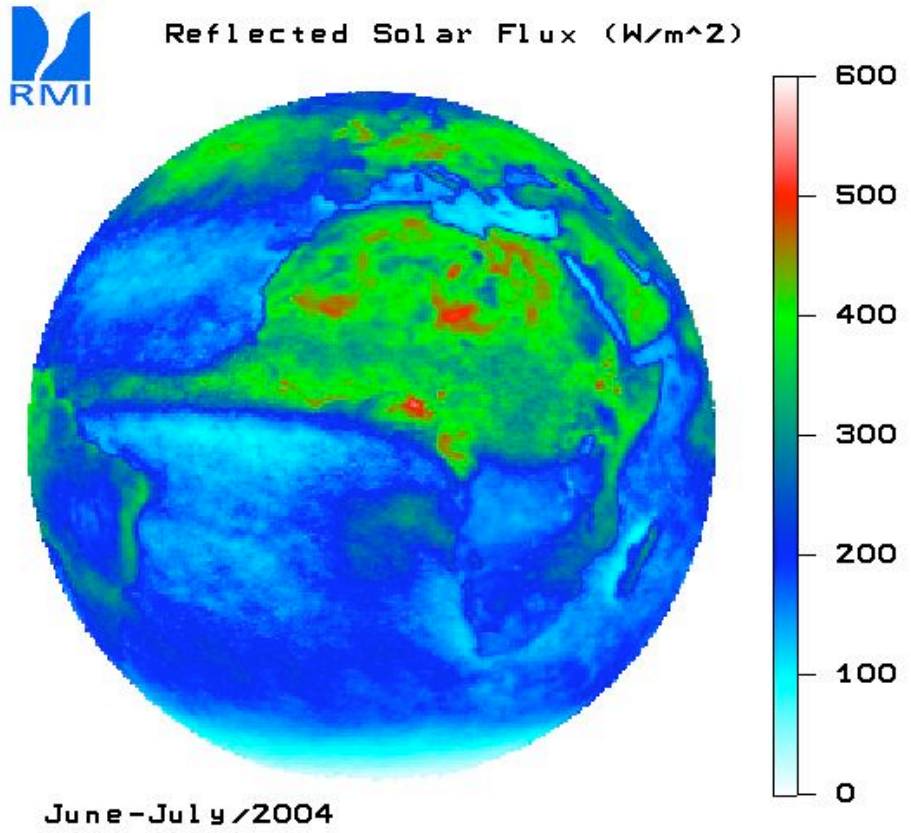
Regional distribution FM3



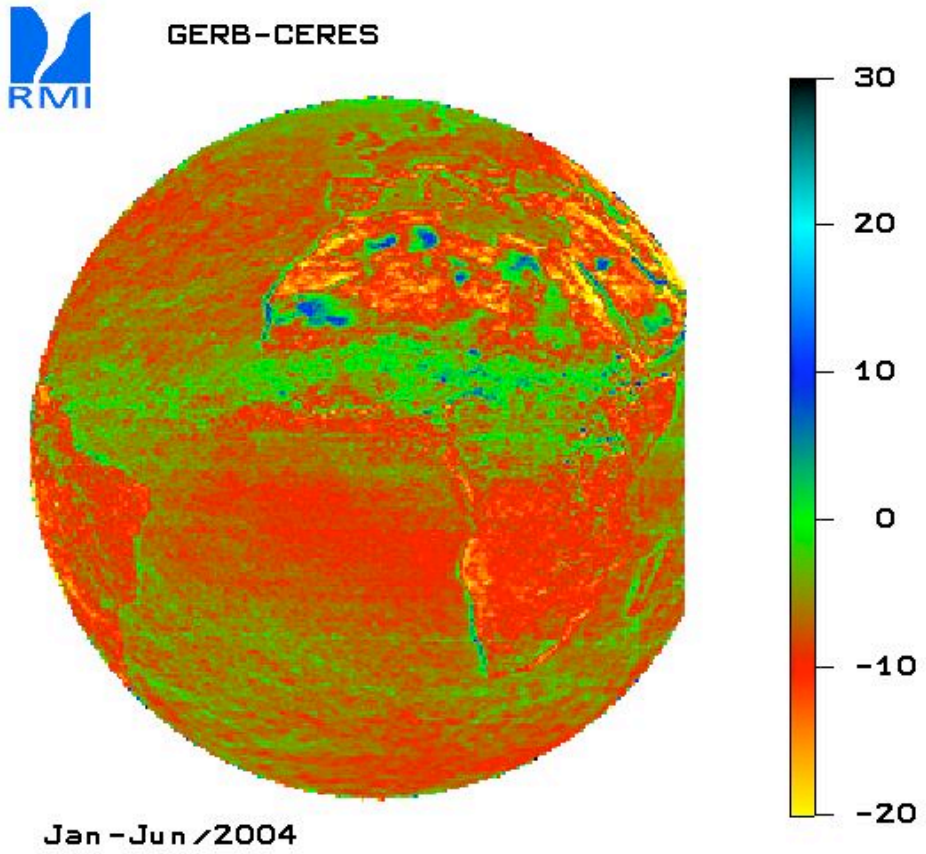
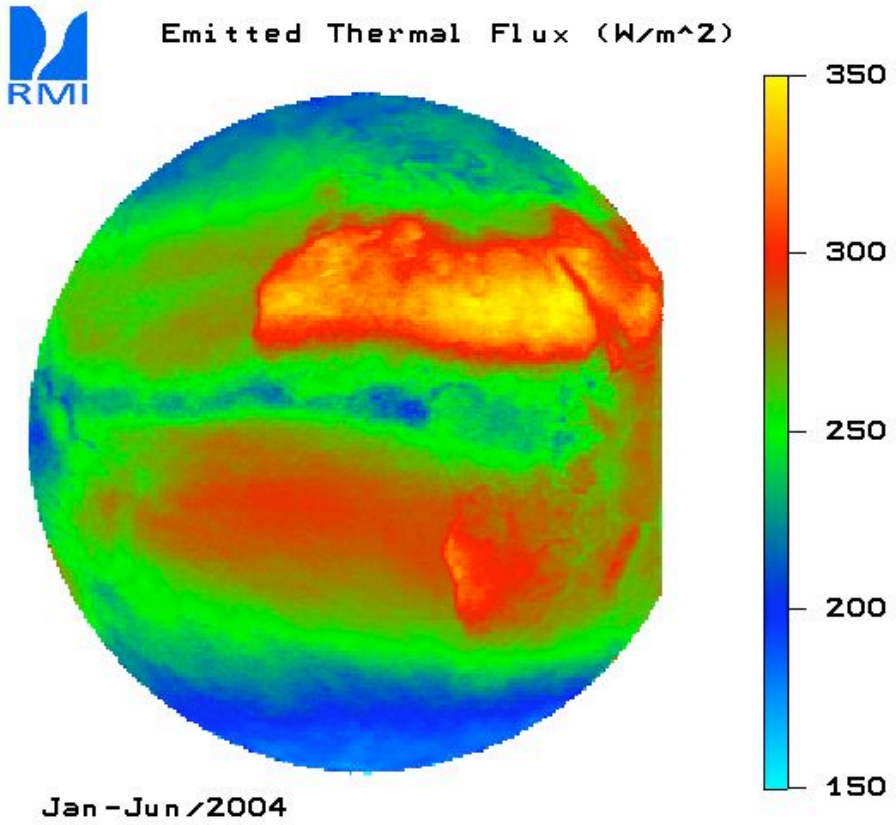


GERB – CERES FM2





Conclusions

- With new GERB spectral response reflected solar fluxes are about 6% higher then CERES.
- Net GERB flux is about 2 W/m^2 higher then CERES.
- Regional analysis reveals particularly non average reflected solar flux differences
  - over desert
  - in clear sky sun-glint region

GERB - CERES FM3