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Edition 2 processing

Calibrations

RMIB project status

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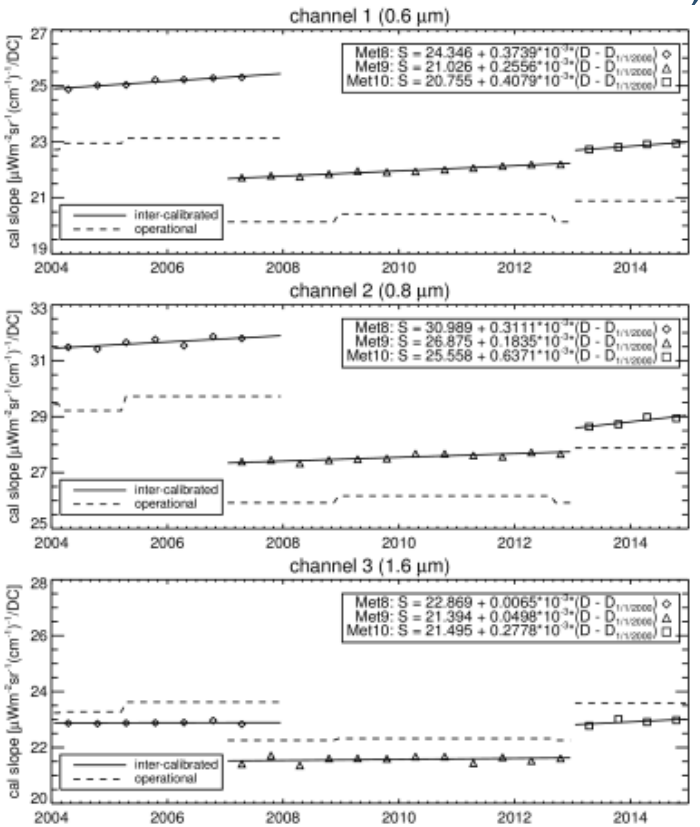
- new visible SEVIRI calibrations from *Meirink et al. (2013)* [OK]
  - smooth coefficients from launch time for 0.6, 0.8 & 1.6 μm



- new GERB calibrations (from Imperial College) [TBD]

▶ mitigate the impact of instruments' ageing

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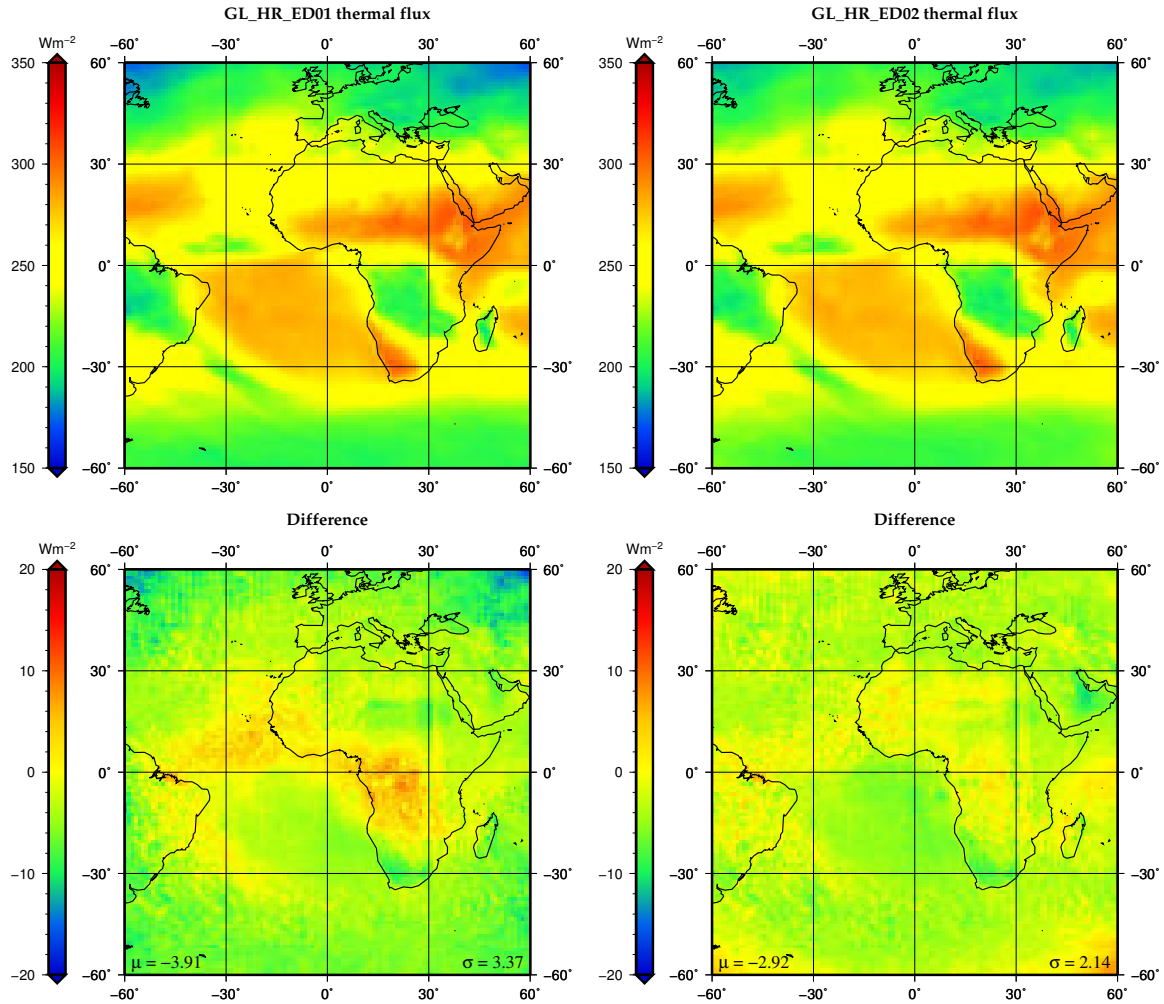
New SEVIRI BT & BTD regressions for radiance–to–flux [OK]



relative to CERES_EBAF-TOA_Ed2.8_Subset_200512-200512

Ocean wind speed

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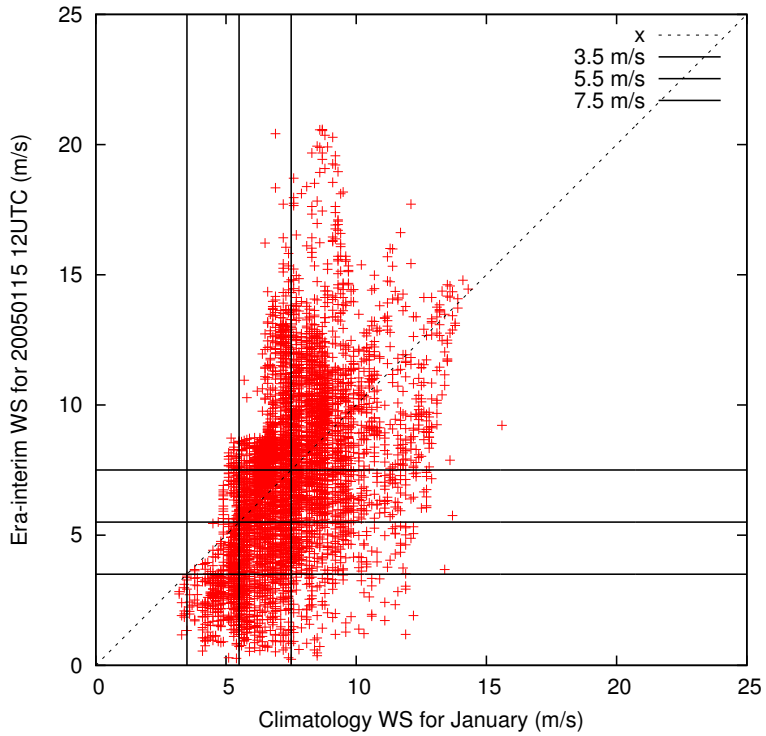
ERA-interim wind speed (re-analysis) instead of QuikSCAT monthly climatology: [OK]



- data downloaded & regridded on HR FOV
- interpolation at half slot acquisition time from 6–hourly
- ▶ expected improvements in clear ocean solar fluxes

Clear-sky reflectances

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Further work

- optimized offline program for daily generation [OK]
  - linear adjustmment of percentile within sunglint region
  - post–processing to filter out residual clouds over ocean
  - data converted back in equivalent digital counts
- generated for MSG1 & MSG2 [OK]
- ingestion into SEVIRI processing [OK]

▶ mitigate the dependency to specific calibration

Cloud analysis

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Further work

- New cloud LUTs: [OK]
  - libRadtran
  - convoluted with SEVIRI VIS006 & VIS0008 filters
  - accurate water & ice phase functions
  - surface parameterized as lambertian according to albedo
  - optimized packing & handling routines

- New cloud phase detection: [OK]
  - inspired by MODIS bi-spectral algorithm
  - adapted to SEVIRI by *Wolters et al. (2008)*
  - bi-spectral $BT_{10.8}$ & $BTD_{8.7-10.8}$ threshold tests

Misc stuffs

[OK]

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Further work

- NB2BB radiances : new solar & thermal regressions using V003 & SEVIRI
- Effective SEVIRI thermal radiances
- Fresh snow detection (*Bertrand et al., 2008*) & averaged fresh snow solar ADM
- Clearsky ocean ADMs for restored dust pixels (*Brindley & Russell, 2006*) instead of cloudy ocean ADMs
- Ignatov AOD retrieval algorithm on native SEVIRI resolution (*De Paepe et al., 2008*)

Comparisons

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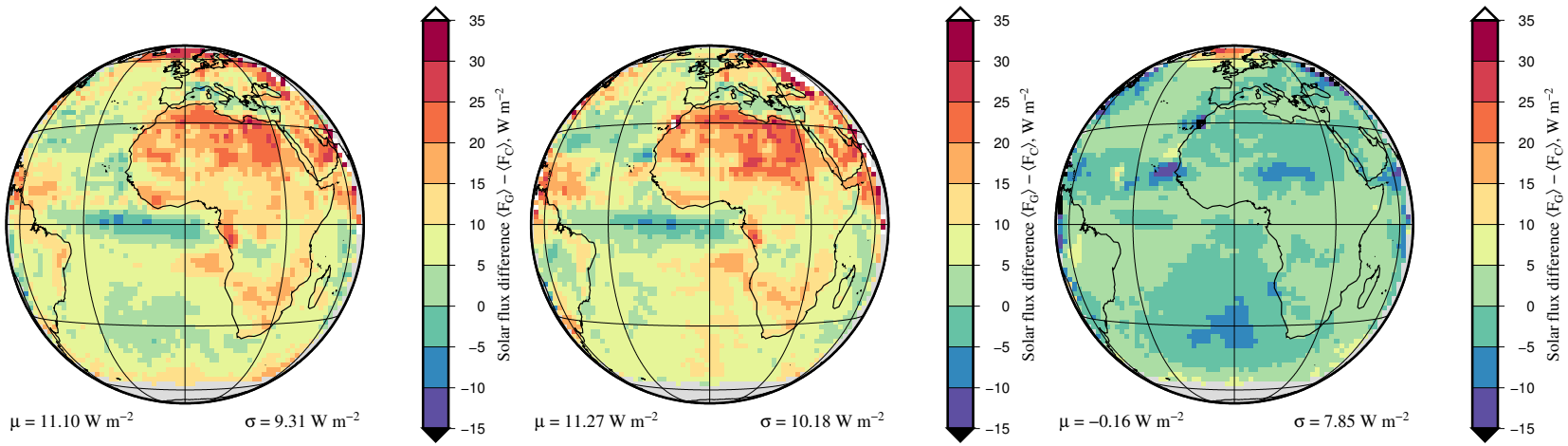
For June 2004 using CERES SSF Edition 4A compared to

- GERB V003 solar fluxes
- GERB V006 solar fluxes (ED02 candidate)
- excluding sunglint region ($\Psi < 25^o$)



allsky

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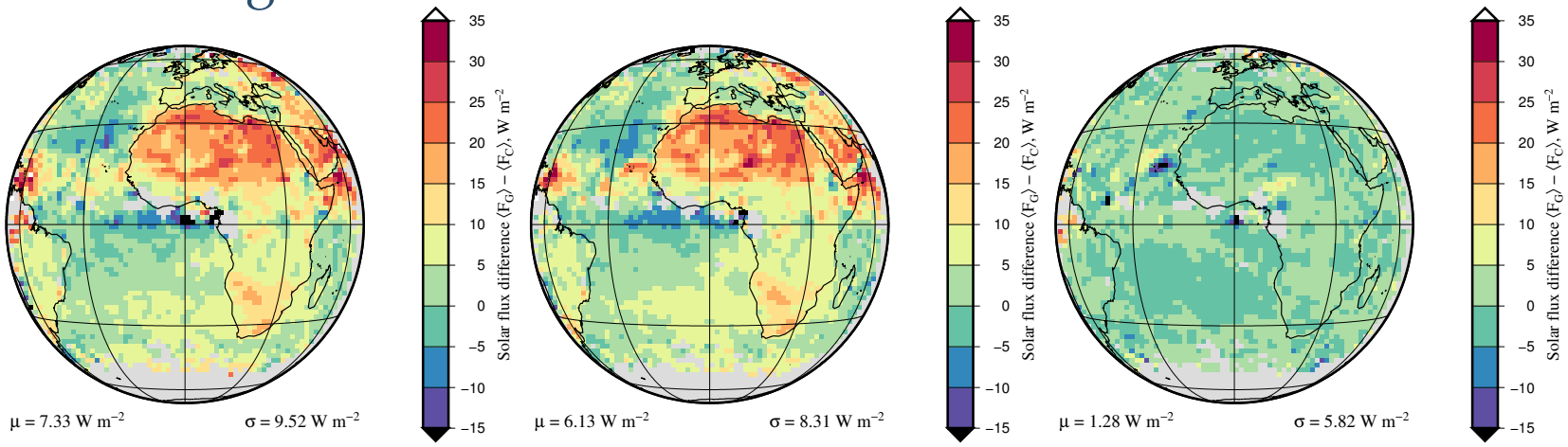
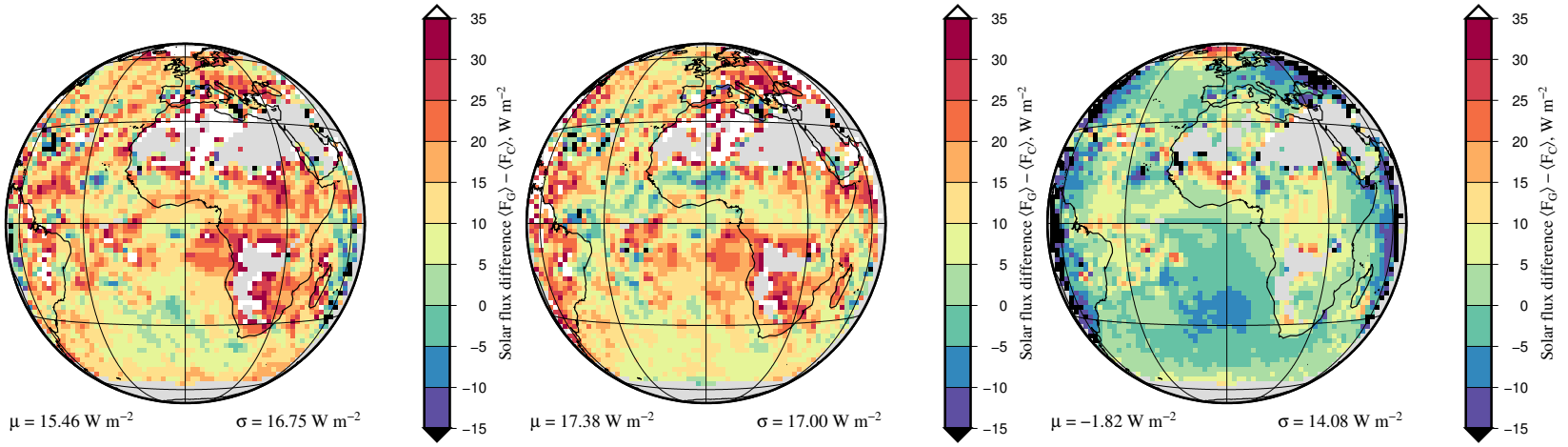
For June 2004 using CERES SSF Edition 4A compared to

+ matching sceneIDs



clearsky



overcast

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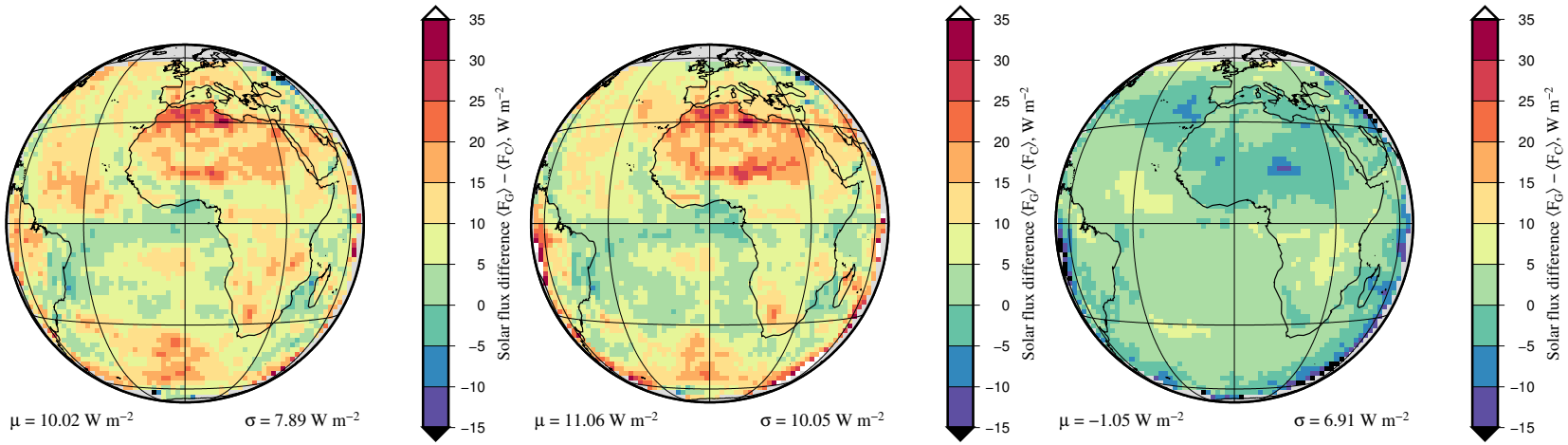
For December 2004 using CERES SSF Edition 4A compared to

- GERB V003 HR solar fluxes
- GERB V006 HR solar fluxes (ED02 candidate)
- excluding sunglint region ($\Psi < 25^o$)
- matching sceneIDs



allsky

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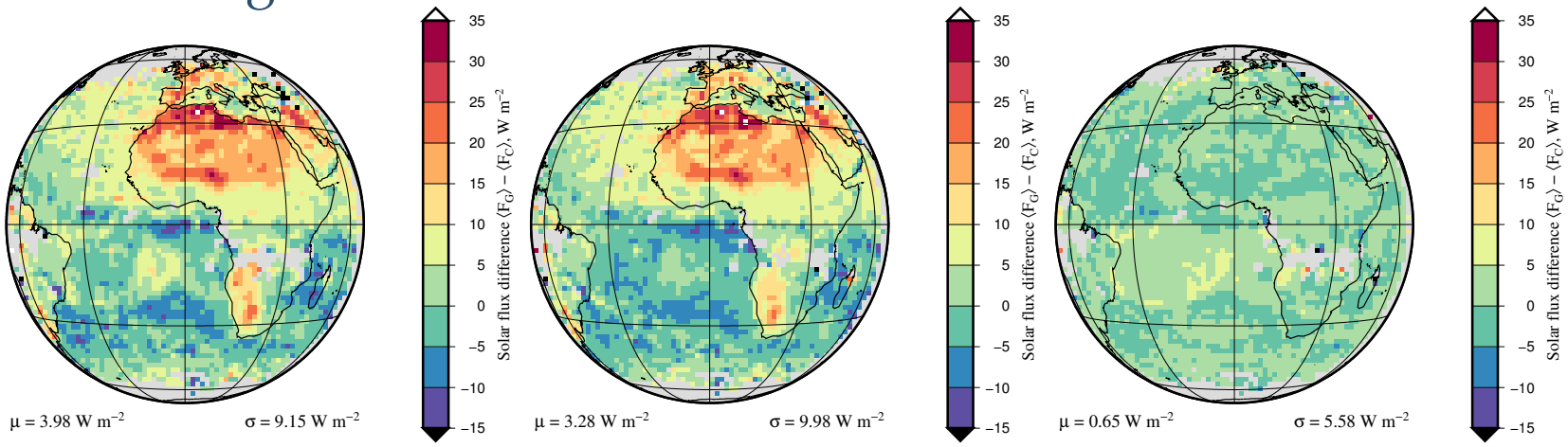
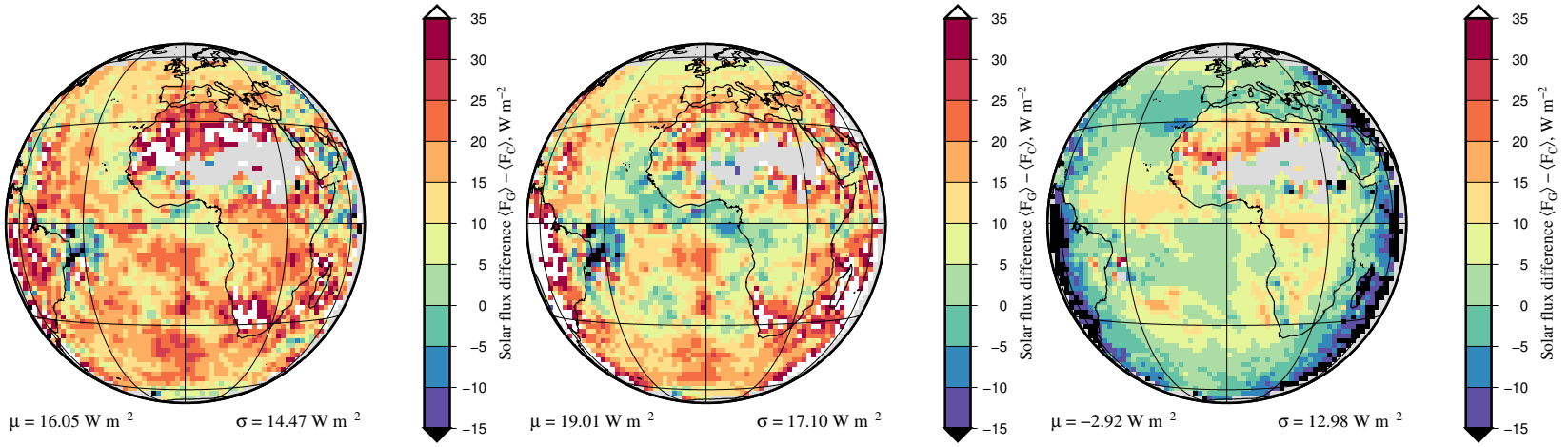
+ matching sceneIDs



clearsky



overcast

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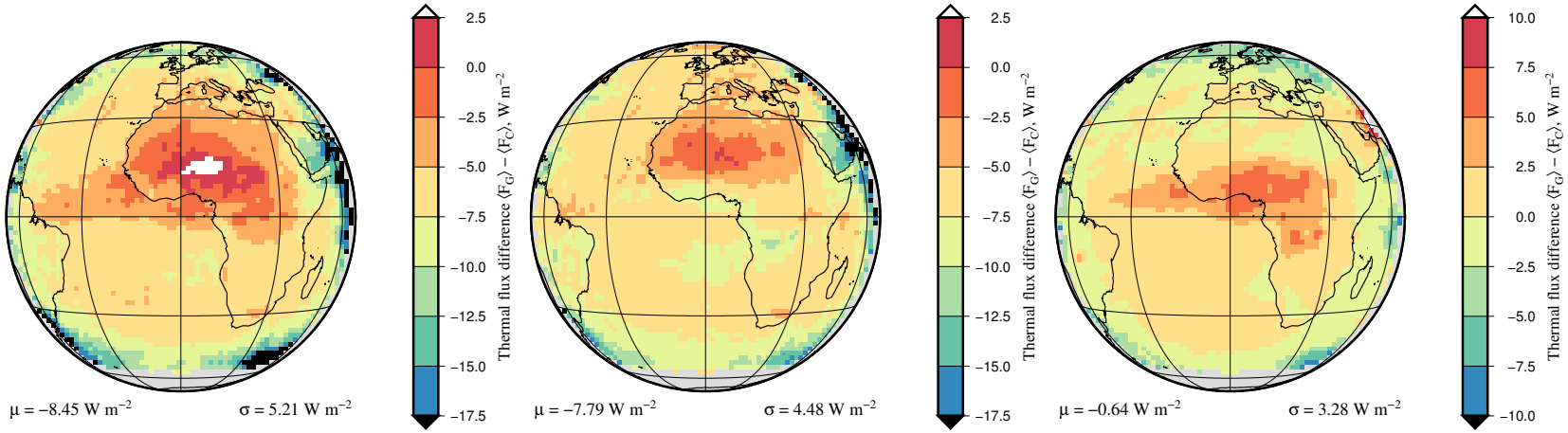
For June 2004 using CERES SSF Edition 4A compared to

- GERB V003 HR thermal fluxes (ED01 candidate)
- GERB V006 HR thermal fluxes (ED02 candidate)



allsky

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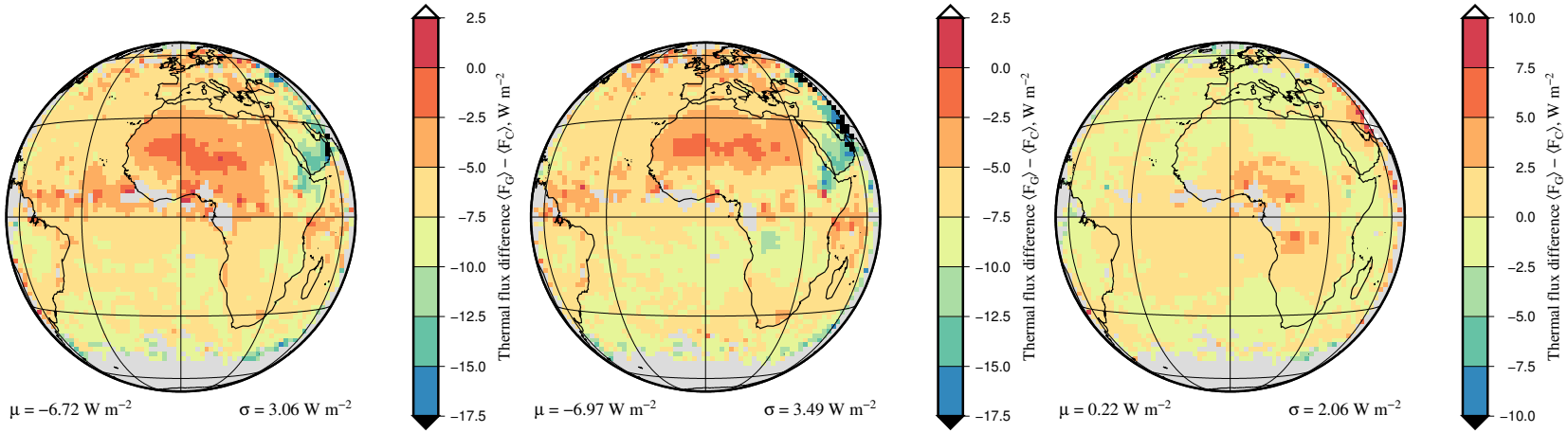
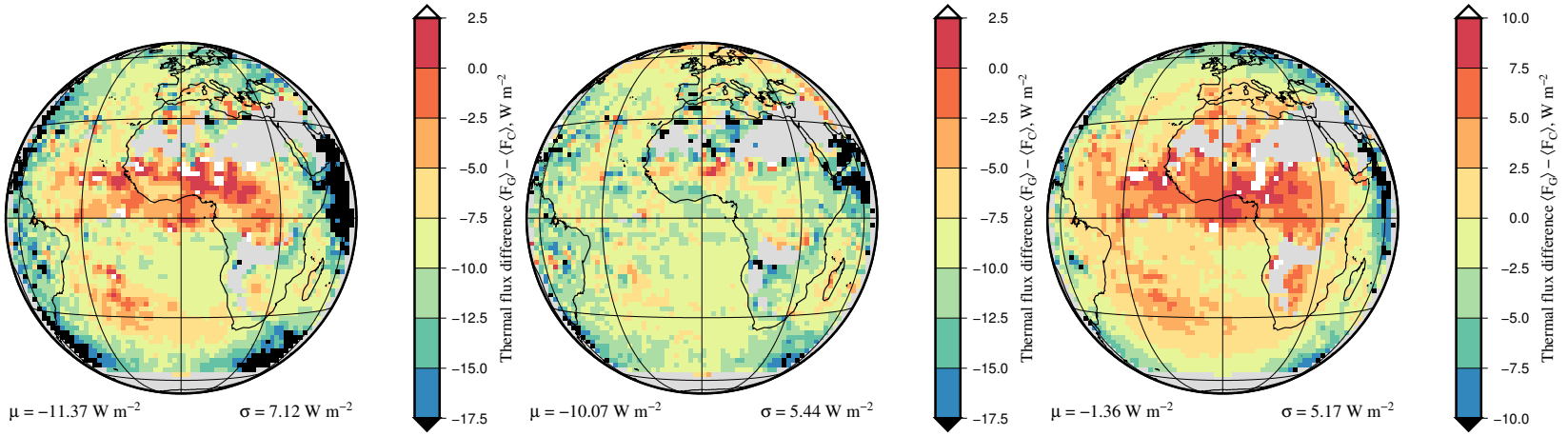


clearsky



overcast

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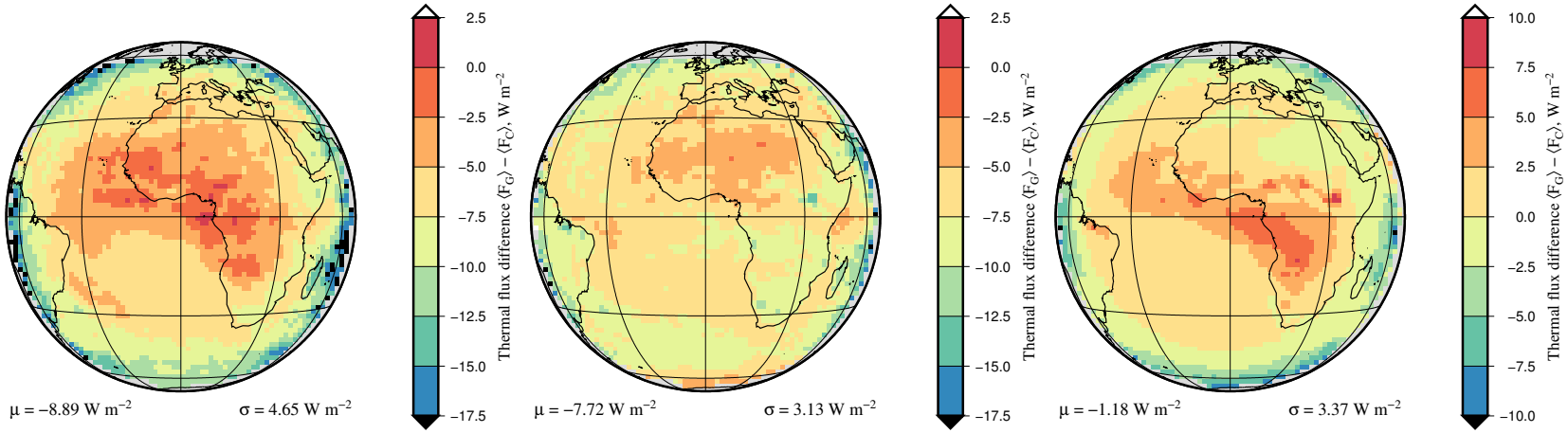
For December 2004 using CERES SSF Edition 4A compared to

- GERB V003 thermal fluxes (ED01 candidate)
- GERB V006 thermal fluxes (ED02 candidate)



allsky

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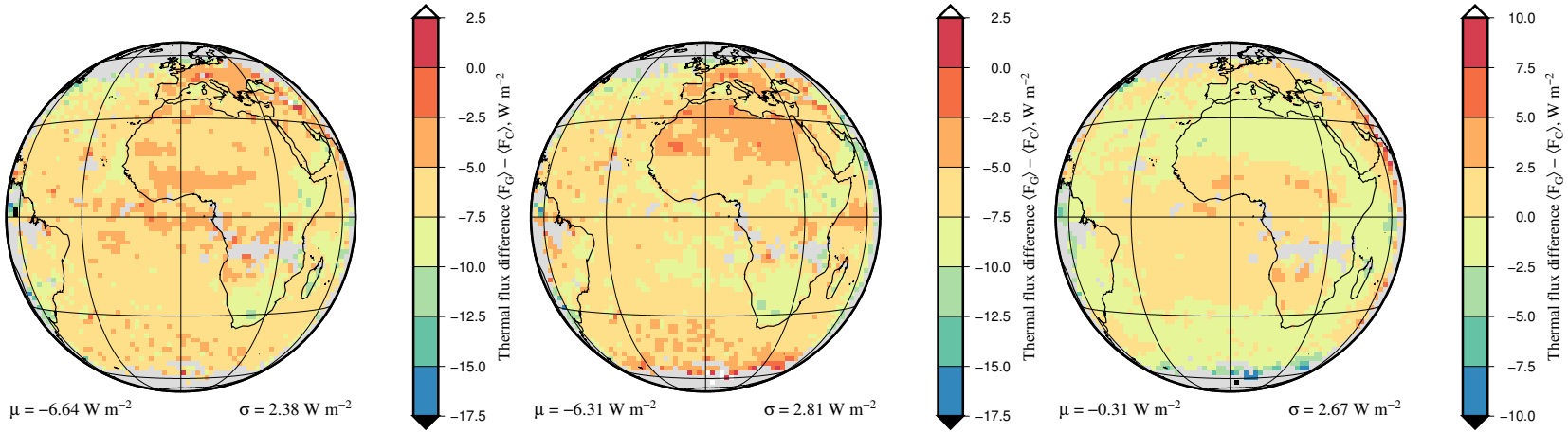
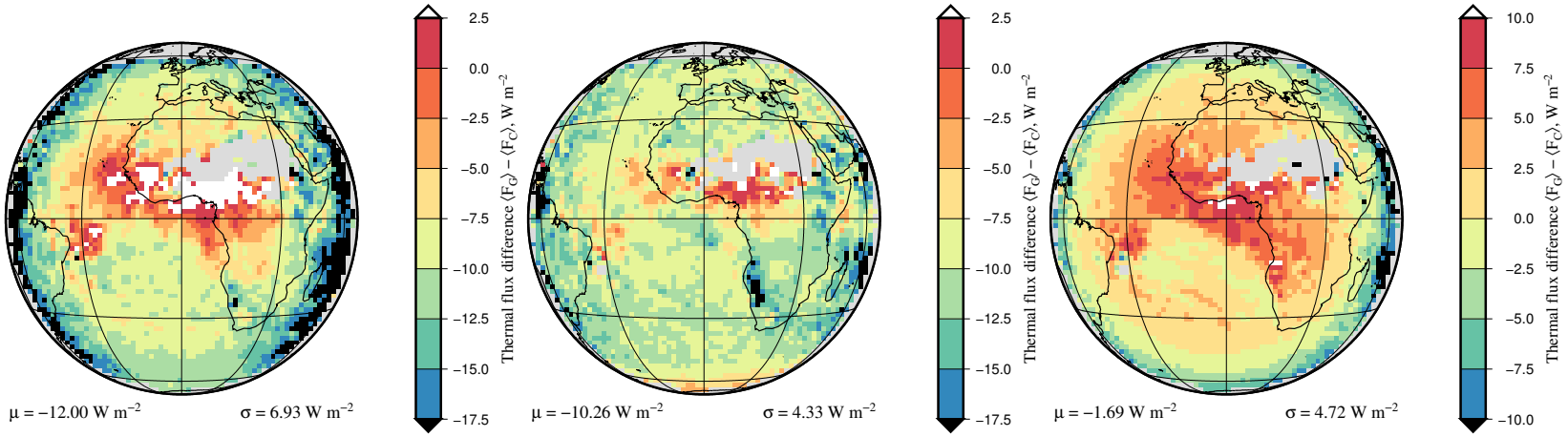
For December 2004 using CERES SSF Edition 4A compared to



clearsky



overcast

Dynamic surface type

[TBD]

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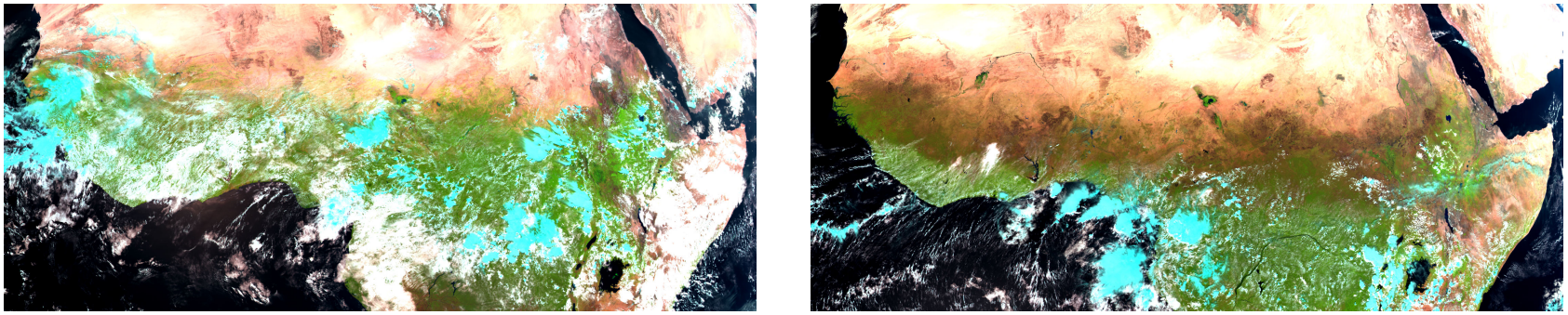
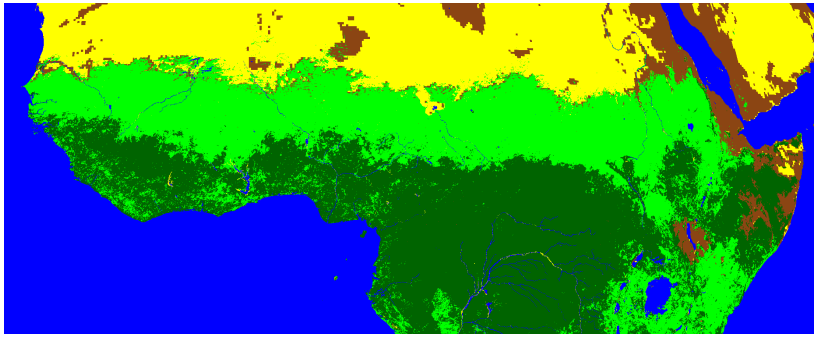
Further work

ED01 processing uses fixed CERES surface map while seasonal vegetation cycles occur especially in the Sahel region



August & December 1 2005 at 12:00 UTC



CERES surface map

► expected improvements in Sahel region (transition between desert & vegetation)

Dynamic surface type

[TBD]

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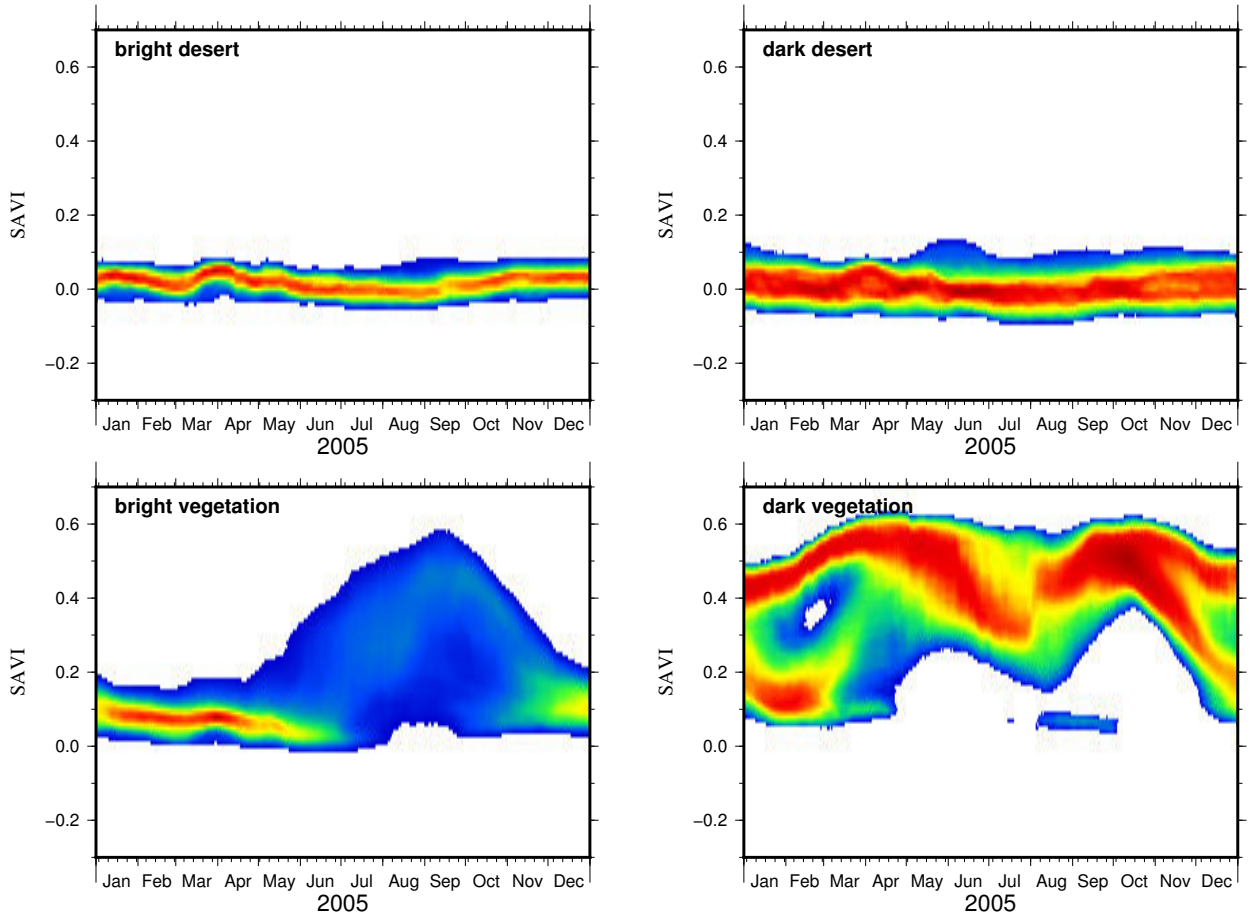
Surface reclassification according previous day SAVI computed from daily local noon clear-sky reference

$$\mathrm{SAVI} = (1+L)(\rho^{cs}_{0.8} - \rho^{cs}_{0.6}) / (\rho^{cs}_{0.8} + \rho^{cs}_{0.6} + L) \text{ with } L = 0.5$$



Dynamic surface type

[TBD]

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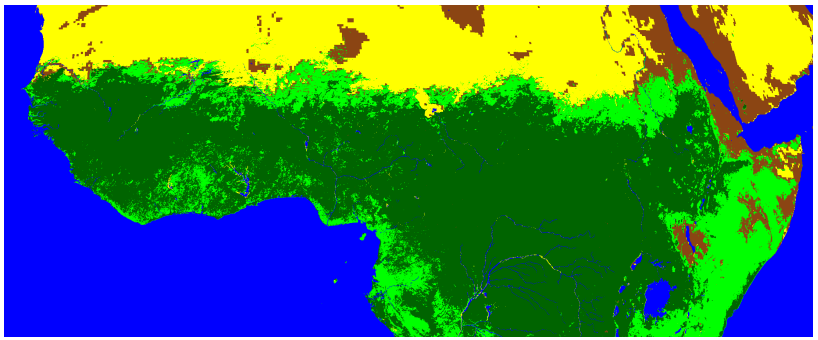
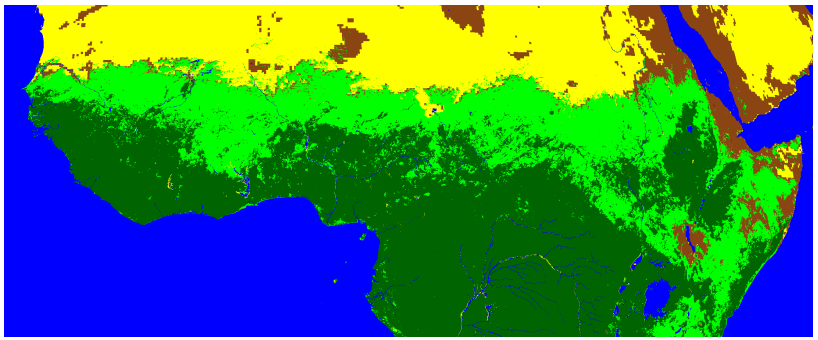
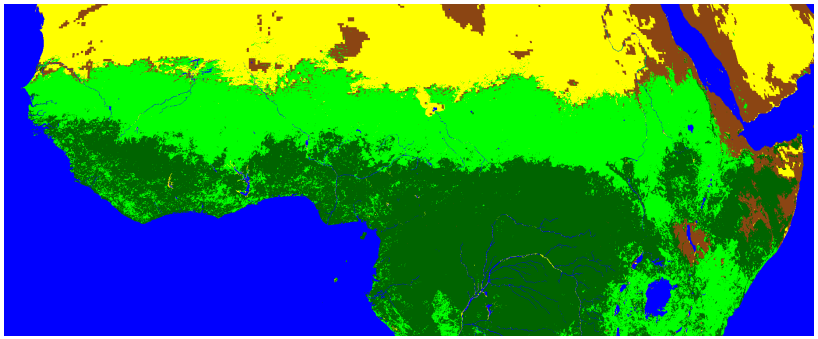
Further work

- For bright vegetation pixels with SAVI$>$ 0.2 $\rightarrow$ dark vegetation
- For dark vegetation pixels with SAVI$<$ 0.2 $\rightarrow$ bright vegetation





August & December 1 2005 at 12:00 UTC



CERES surface map

▶ GERB-like solar fluxes generated for August 2005 (comparisons with CERES SSF pending)

Further work

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Further work

- Investigate degraded solar comparisons
  - check on GERB-like products
  - compare cloud properties retrievals with CERES GEO cloud products (see "poster")
  - use NWCSAF dust product
  - tune cloudy/clearsky τ threshold to the new cloud LUTs
- Implement all [TBD]
- Include all non-GERB specific fields in GL
- Revisit SEVIRI IR cloud mask algorithm
- Process for comparisons campaigns
- Re-perform comparisons
- Process whole dataset as Edition 2