# Gerb Processing : Tests description

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## Contents

CHANGE RECORD

| Issue | Date | Approved by | Reason for change |
|---|---|---|---|
| Version 1 | 10/08/00 | | new document |
| Version 2 | 06/09/00 | | DELTA review RIDs |

# 1 Scope of this document

The scope of this document is to describe tests performed for development and validation of the Gerb Processing (GP) program. This document should be read as an annex of the main Gerb Processing document ( MSG-RMIB-GE-TN-04[1]) that describes the GP algorithms. An other document can help you to understand GP program structure, and GP communications (input and output files) with others RMIB GERB ground segment processings (i.e. input and output files). This document is titled"GP: Program description"[2].

# 2 Testing data generation

Since real GERB and SEVIRI data will not be available before MSG launch, artifical data has to be generated to develop and test the RMIB GERB ground segment processings.

The simulation of input data required by the GERB Processing is described in the main GERB processing document, section 6 [1]:

- simulation of SEVIRI and GERB geolocation tables,
- simulation of PSF and A factor for each GERB detector,
- and simulation of GERB and SEVIRI based images.

In the case of the GERB and SEVIRI images, 2 kinds of simulation were designed.

First, we generated totaly artificial images, then we try to derive more realistic images using Meteosat 7 data.

To generate the first kind of images, we implemented a program, called "DataSim", that simulates GERB and SEVIRI view of "Earth" modeled by a sphere recoved by big rectangles. These images of rectangles were used during the first steps of the algorithm development, to check sub-part or sub-functions, and their dependencies.

Then when a first version of the "GERB Processing" was validated according to these artificial GERB and SEVIRI images, we tried to generate more realistic images using real data from Meteosat 7. These testing images were used in particular to measure computing material requirement (i.e. RAM, computing time,..) and are described in section 6

## 2.1 Description of simulated artificial data

As described in the main GERB processing document ([1] section 6), all the input data required by the GERB Processing have been first artificially simulated.

### 2.1.1 GERB geolocation tables

A program called "mainGerbGeo" has been implemented in order to genarate non-rectified GERB geolocation tables. This program calculates latitude and longitude for each pixel of an GERB image, and saves them in a IP_images structures.

4 command line arguments allow us to take into account possible detectors misalignements, satellite movement regarding to its nominal position, misalignement of the de-spin mirror,.. :

d_pixel = range (expressed in degrees) of the azimuth modifications due to pixels alignment imperfections.
Remark: should be smaller than one pixel resolution : 0.08 degrees

sat_mvt = range (in metres) of the possible satellite movements between two scans (=600ms).
Remark: satellite speed = 80m/s => 48m / 600ms

sat_rot = range (expressed in degrees) of eventual satellite rotation between two scans (=600ms).
Remark: To avoid pixel inversion : sat_rot < 0.45 degrees

view_angle = range (expressed in degrees) of eventual perturbation of the satellite viewed angle.
Remark: should be smaller than one pixel resolution : 0.08 degrees

Using this program we generate different GERB geolocation tables, we denote :

| Reference number | d_pixel | sat_mvt | sat_rot | view_angle | Comments |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | perfect GERB geolocation |
| 2 | 0 | 0 | 0.45 | 0 | |
| 7 | 0 | 5 | 0.1 | 0.1 | |
| 1 | 0 | 0 | 0 | Azim= 0.05=Cte | global azimuthal deviation |

### 2.1.2 PSF filters

Several types of PSF filters were generated, 2 are used in the following tests :

- PSF 3*3 : a PSF filter table that spread onto 3*3 high resolution pixels (i.e 3*3 * 3*3 SEVIRI pixels), but only the central point is taken into account, and is equal to 1, while the surrounding points are null.
- PSF 15*15 : a more realistic PSF that spreads onto 15*15 high resolution pixels (i.e. 45*45 SEVIRI pixels), modelled by a gaussian, and slightly different according to each GERB detector.

Table 1: Reference (GERB SW) dates of simulated data

| Reference date | scene description | GERB SW | geoloc TW | PSF | A |
|---|---|---|---|---|---|
| 19800101001737 | uniform sphere | 0 | 0 | 15*15 | A_0 |
| 19800101031737 | “ | 0 | 0 | 3*3 | A_0 |
| 19800101120237 | “ | 0 | 0 | 15*15 | A_1 |
| 19800702151737 | “ | 7 | 2 | 15*15 | A_0 |
| | | | | | |
| 19900101150237 | 10 static rectangles | 0 | 0 | 15*15 | A_1 |
| 19900702031737 | “ | 7 | 2 | 3*3 | A_1 |
| 19900702151737 | “ | 7 | 2 | 15*15 | A_1 |
| 19901002151737 | “ | 1 | 2 | 15*15 | A_1 |
| | | | | | |
| | 10 static + 10 moving rectangles | | | | |
| 19950101031737 | “ | 0 | 0 | 3*3 | A_0 |
| 19950101151819 | “ | 0 | 0 | 15*15 | A_1 |
| 19950702031737 | “ | 7 | 2 | 15*15 | A_1 |
| 19950702151737 | “ | 7 | 2 | 15*15 | A_1 |

#### 2.1.3 A factor table

Two tables of the A factor were generated :

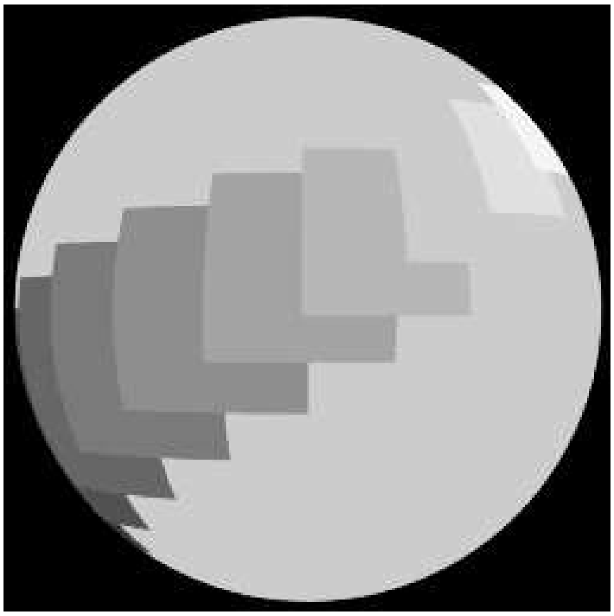
- A_0 : perfect table, A=1 for all the GERB detectors.
- A_1 : A is randomly chosen in the range [0.9,1.1].

#### 2.1.4 Table of artificial data sets

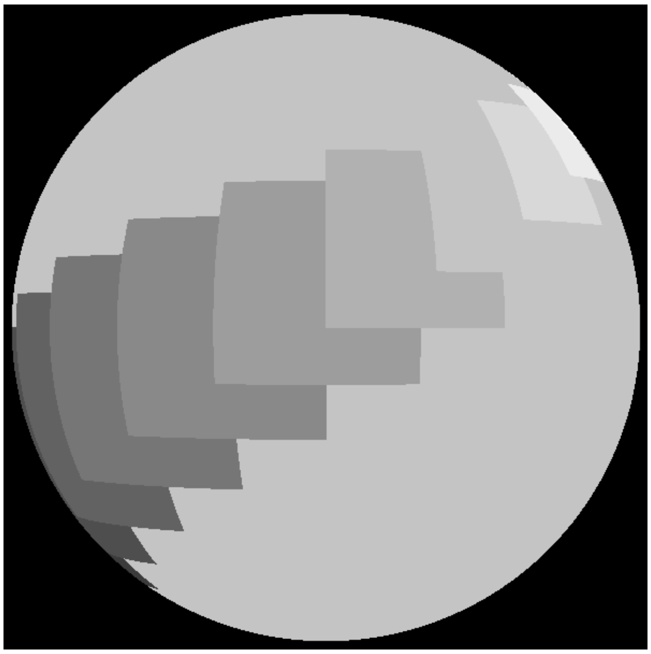
Giving these A factor, PSF, and GERB geolocation tables as input to our scene generation program “DataSim”, we get different levels of complexity of the scene. The GERB and SEVIRI images generated in such way are saved on disk according to a reference date (following the GERB specification) :

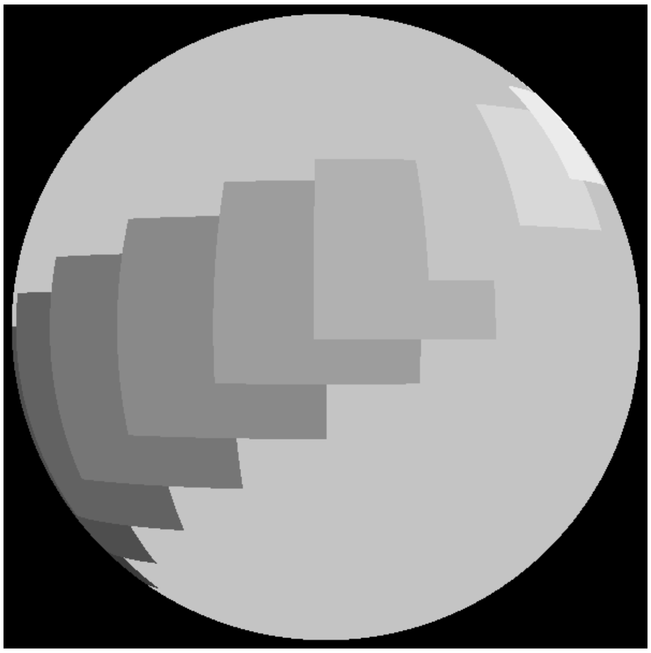
### 2.2 Exemples of simulated artificial images

GERB L1.5 Short Wave radiance image (file: L15_SW_19950702151737_01.rma)



SEVIRI Short Wave radiance estimation images :
(files: GSWE_19950702150000_01.rma and GSWE_19950702153000_01.rma
)





# 3 Test of sub-functions and sub-algorithms

## 3.1 GerbProcFilesExistenceTest

**Purpose of the test:**

Test function GerbProcFilesExistenceTest when source(s) file(s) is missing.

**Methods:**

We launch the main Gerb Processing program according to one specific SW time, after having deleted a source file.

**Pass/fail criterion:**

Test passes if the program stops and exits properly.

**Inputs:**

We use data set according to reference time 19800101120237, by typing the command line :

GerbProc -v -p -i L15_SW_19800101120237_01.rma

**Outputs:**

- SW case :

| Missing source file | result | status of the test |
|---|---|---|
| L15_GEO_19800101120237_01.ims | program exits properly | PASS |
| L15_MaD_19800101120237_01 | " | " |
| DetectorIndex_used | " | " |
| PSF_SW_045.rma | " | " |
| GSWE_19800101120000_01.rma | " | " |
| GSFE_19800101120000_01.rma | " | " |

- LW case :

| Missing source file | result | status of the test |
|---|---|---|
| L15_TW_19800101120000_01.rma | program exits properly | PASS |
| L15_GEO_19800101120000_01.ims | " | " |
| L15_MaD_19800101120000_01 | " | " |
| L15_TW_19800101120514_01.rma | " | " |
| L15_GEO_19800101120514_01.ims | " | " |
| L15_MaD_19800101120514_01 | " | " |
| DetectorIndex_used | " | " |
| A_gerbtime | " | " |
| PSF_LW_000.rma | " | " |
| GLWE_19800101120000_01.rma | " | " |
| GTFE_19800101120000_01.rma | " | " |

**Date of the test: March 99**

**Status of the test: PASS**

## 3.2 Conversion of SEVIRI based flux data into GERB configuration images.

In this section, we focus on testing the sub-program part that converts SEVIRI based flux and radiance images into GERB SW configuration, i.e. into GERB SW acquisition time, resolution and geolocation.

### 3.2.1 Preliminary tests :

We started with preliminary tests :
Check PSF reading

| | |
|---|---|
| Purpose of the test | Check PSF reading |
| Methods | Visualisation of PSF images according to several detectors, |
| | and comparison with PSF data base. |

| Input data set | Pass criterion | Status |
|---|---|---|
| 19800101001737 | PSF image = PSF 15*15 | PASS |
| 19800101031737 | PSF image = PSF 3*3 | PASS |

Check SEVIRI_based input files reading

| | |
|---|---|
| Purpose of the test | Check SEVIRI_based input files reading |
| Methods | Visualisation of SEVIRI_based read images (fct : LP_ImagePlot) |
| | and comparison with SEVIRI_based data base.(app.: viewrma) |

| Input data set | Pass criterion | Status |
|---|---|---|
| 19900101150237 | 3 identical images | PASS |
| 19950101151819 | 3 images with moving rectangles | PASS |

### 3.2.2 Test time interpolation.

**Purpose of the test: Test time interpolation.**

**Methods:**

1. Compare the input GERB SW image and the SEVIRI based SW radiances converted at GERB SW configuration, in data set case where geolocation and PSF problems are avoided. (i.e. perfect geolocation and static scene case). Comparisons are performed using image visualisation (viewrma) and image difference calculation (imdiff).
2. Calculate by hand SW radiance interpolated value at one pixel where rectangles have moved and compare with computed value.

**Test table:**

| Input reference date | Comments | Pass criterion | Status |
|---|---|---|---|
| 19800101011737 | static scene<br>perfect geolocation<br>PSF 3*3 | input GERB SW image<br>= SEVIRI_based SW image | PASS |
| 19950101011737 | moving rectangles<br>perfect geolocation<br>PSF 3*3 | 1. Input GERB SW image<br>is similar to<br>SEVIRI_based SW image | |
| | | 2. Check SW interpolation<br>calculation at pixel (97,125) | PASS |

### 3.2.3 Test PSF down sampling

**Purpose of the test: Test PSF down sampling**

**Methods:**

Compare the input GERB SW image and the SEVIRI based SW radiances converted at GERB SW configuration, in data set case where geolocation and time interpolations are avoided.

**Test table:**

| Input data set | Comments | Pass criterion | status |
|---|---|---|---|
| 19900101150237 | static scene<br>perfect geolocation<br>PSF 15*15 | Input GERB SW image<br>= SEVIRI_based SW image | PASS |

### 3.2.4 Test geolocation conversion.

**Purpose of the test: Test geolocation conversion**

**Methods:**

Compare the input GERB SW image and the SEVIRI based SW radiances converted at GERB SW configuration image, in data set case where time interpolation and PSF problems are advoided, i.e. where geolocation conversion is the main problem.

**Test table:**

| Input data set | Comments | Pass criterion | Status |
|---|---|---|---|
| 19900702031737 | static scene<br>pertubed geolocation<br>PSF 3*3 | Input GERB SW image<br>is similar(*) to<br>SEVIRI_based SW image | PASS |

(*) The SEVIRI based SW radiance value down sampled to a GERB non-perfect geolocation may differ from the GERB SW radiance generated by the data simulation program because the second one value is computed at the exact GERB geolocation while for the first one we look at the closest SEVIRI pixel geolocation.

#### 3.2.5 Test mixed conversion.

**Purpose of the test: Test mixed time, geolocation conversion and PSF down sampling.**

**Methods:**

Compare the input GERB SW image and the SEVIRI based SW radiances converted at GERB SW configuration, for several data set cases.

**Test table:**

| Input data set | Test purpose | Pass criterion | Status |
|---|---|---|---|
| 19950101151819 | PSF + time | Input GERB SW image is similar to SEVIRI_based SW image | PASS |
| 19900702151737 | geoloc + PSF | “ | “ |
| 19901002151737 | “ | “ | “ |
| 199950702031737 | geoloc + time | “ | “ |
| 199950702151737 | geoloc + time +PSF | “ | “ |

### 3.3 Calculation of correction factor

**Purpose of the test:**

Test calculation of GERB and SEVIRI based radiances ratio, or check the output correction factor image GC_SF (_TF).

**Methods:**

1. Check, in cases where the SEVIRI based radiance image convolved at GERB SW configuration is perfectly matching the input GERB radiance image, that correction factors are equal to 1.
2. Check “by hand”, for pixels where SEVIRI based radiance convolved at GERB SW configuration is different from the input GERB radiance, the ratio calculation.

**Test** table 1 :

| Input data set | Comments | Pass criterion | status |
|---|---|---|---|
| 19800101011737 | static scene perfect geolocation PSF 3*3 | C_SF=1 | PASS |
| 19900101150237 | static scene perfect geolocation PSF 15*15 | C_SF=1 | PASS |

**Test** table 2 :

| Input data set | Comments | Pass criterion | Status |
|---|---|---|---|
| 19950702151737 | moving scene<br>pertubed geolocation<br>PSF 15*15 | C_SF(85,75)<br>= 245.52/274.92<br>= 0.893 | PASS |

## 3.4 Computation of corrected L2 flux.

**Purpose of the test:**

Test building of corrected L2 flux image computed by multiplication of correction factors and SEVIRI based fluxes at GERB SW configuration.
= Check the L20_SF (_TF) product image.

**Methods:**

1. Check, in cases where correction factors are everywhere perfectly equal to 1, that the corrected L2 flux image is perfectly matching the SEVIRI-based flux image convolved at GERB SWconfiguration.
2. Check “by hand”, in cases where correction factors are not everywhere equal to 1, the corrected L2 flux calculation.

**Test** table 1 :

| Input data set | Comments | Pass criterion | status |
|---|---|---|---|
| 19800101011737 | static scene<br>perfect geolocation<br>PSF 3*3 | SEVIRI_based SF image<br>= L2 corrected SF image | PASS |
| 19900101150237 | static scene<br>perfect geolocation<br>PSF 15*15 | SEVIRI_based SF image<br>= L2 corrected SF image | PASS |

**Test** table 2 :

| Input data set | Comments | Pass criterion | Status |
|---|---|---|---|
| 19950702151737 | moving scene<br>pertubed geolocation<br>PSF 15*15 | L2_SF (85,75)<br>= 359.47<br>= 0.893 * 402.5 | PASS |

## 3.5 Building of GERB LW image (fct : GerbLWinterpol)

In the thermal case, the GERB LW radiances are computed from GERB SW and TW radiances. The geolocation and time interpolation processes implemented for this purpose into subfunction “ GerbLWinterpol” are tested in this section.

### 3.5.1 Test time interpolation

**Purpose of the test 1 :**

Test interpolation of TW images to SW acquisition time.

**Method 1 :**

We generate with the program "DataSim" a TW image with SW acquisition time, then we check that this image matches the time interpolation of the 2 surrounding-in-time TW images.

**Date of the test 1 : May 99**

**Status of the test : PASS**

**Purpose of the test 2 :**

We check TW interpolation if the 2 input GERB TW images are identical.

**Method 2 :**

Compare the 2 input GERB TW images and the interpolated image for static scene case. Images are compared using the application "imdiff".

**Test table 2 :**

| Input reference date | Comments | Pass criterion | Status |
|---|---|---|---|
| 19800101011737 | static scene | input GERB TW image 1<br>= input GERB TW image 2<br>= interpolated GERB TW image | PASS |

**Status of the test 2 : PASS**

**Purpose of the test 3 :**

We check TW interpolation calculation for moving scene cases.

**Method 3 :**

We calculate by hand the TW interpolated value at one pixel where rectangles have moved and compare with computed value.

**Test table 3 :**

| Input reference date | Comments | Pass criterion | Status |
|---|---|---|---|
| 19950101011737 | moving rectangles | $TW(t^*) = \alpha 1.TW(t1) + \alpha 2.TW(t2)$ | PASS |

### 3.5.2 Test LW calculation.

**Purpose of the test:**

Test LW radiance calculation from TW and SW radiance values in perfect geolocation cases (in order to avoid geolocation interpolation problems)

**Methods:**

We compare for uniform sphere and perfect geolocation cases the LW radiance values computed, and calculated by hand.

**Pass criterion :**

LW (computed) = TW - A SW (by "hand")

**Test table :**

| Input reference date | Comments | Pass criterion | Status |
|---|---|---|---|
| 19800101001737 | A=Cte=1 | LW = TW - A*SW<br>341.5=683.01-341.5 | PASS |
| 19800101120237 | A=fct(detector)<br>=> the computed LW value<br>is not uniform<br>but depends on detector | LW = TW - A*SW<br>at line 100 :<br>304.94 =<br>378 - 1.07*68.019 | PASS |

### 3.5.3 Test geolocation interpolation

**Purpose of the test :**

Test interpolation of the TW values to the SW geolocations.

**Methods :**

1. For a case where SW and TW geolocations are identical, we check that TW values are unchanged.
2. For cases where SW and TW the geolocations are different, we check, by image plotting, the global shape of the TW1 and TW2 geolocation interpolation images. Then, we check the interpolation calculation for some pixels.

Remark: For both case we use static scenes in order to avoid time interpolation.

**Test table :**

| test case | Input reference date | Comments | Pass criterion | Status |
|---|---|---|---|---|
| 1 | 19900101154737 | | TW(1)=TW(2)<br>TW(interpoled) | PASS |
| 2 | 19900702151737 | | global shape | PASS |
| | 19900102151737 | | global shape | PASS |

**Example of interpolation calculation:**

At SW pixel (134,10) :
SW geolocation : lat: -2.706884 long: -64.395851
Corresponding TW pixel (134,10) => geoloc (-2.74,-64.44)
Table of the closest TW pixels :

| distance | latitude | longitude | flux value |
|---|---|---|---|
| 0.000000 | -2.742913 | -64.438019 | 268.718536 |
| 0.000025 | -2.299978 | -64.378334 | 274.832733 |
| 0.000037 | -3.186277 | -64.509018 | 279.464417 |
| 0.000111 | -1.857400 | -64.329781 | 273.686279 |
| 0.000136 | -3.630144 | -64.591530 | 268.605164 |
| 0.000256 | -1.415109 | -64.292236 | 274.803528 |
| 0.000291 | -2.805619 | -63.015522 | 268.718536 |
| 0.000298 | -4.074588 | -64.685791 | 285.672821 |
| 0.000308 | -3.247291 | -63.079647 | 279.464417 |
| 0.000331 | -2.364359 | -62.961624 | 274.832733 |
| 0.000381 | -2.313269 | -65.928574 | 274.832733 |
| 0.000381 | -3.689443 | -63.154171 | 268.605164 |
| 0.000389 | -2.758099 | -65.995430 | 268.718536 |
| 0.000426 | -1.923442 | -62.917820 | 273.686279 |
| 0.000512 | -4.132147 | -63.239277 | 285.672821 |

Matrix A :
A = [ 1.000000 -2.742913 -64.438019 ]
[ 1.000000 -2.299978 -64.378334 ]
[ 1.000000 -2.805619 -63.015522 ]
flux vector = [ 268.718536 274.832733 268.718536 ]
=> X = [ 345.336536 13.722322 0.604905 ]
=> TW = 345.336536 + 13.722322 -2.706884 +0.604905 -64.395851 = 269.238447

# 4 Error propagation test

**Purpose of the test:**

Test the propagation of an error value in the input data through all the Gerb Processing.

**Methods:**

We introduce an error value (i.e. error value = -10000) at one pixel of one input image, and we follow it through the process. We check its propagation by visualisation of each intermediate image.

**Pass criterion:**

The areas in the output images that are influenced by this value, are set to ERR_VALUE (= -10000)

**Test table for SF case :**

| Name of the file where an error is introduced | Name of contaminated images | Comments | Status of the test |
|---|---|---|---|
| L15_SW_19950702151737_01.rma with pt(100,100)=ERR_VALUE | Correction factor (C_SF)<br>Corrected Solar flux (L20_SF) | 1 pt.<br>1 pt. | PASS |
| L15_GEO_19950702151737_01.ims with pt(100,100)=ERR_VALUE | SEVIRI-based SW at GERB config.<br>Correction factor (C_SF)<br>Corrected Solar flux (L20_SF) | 1 pt.<br>1 pt.<br>1 pt. | PASS |
| GSWE_19950702151500_01.rma with 1pt=pt(500,500)=ERR_VALUE | SEVIRI-based SW at GERB config.<br>Correction factor (C_SF)<br>Corrected Solar flux (L20_SF) | 3*3 pt.(*)<br>“<br>“ | PASS |
| GSFE_19950702151500_01.rma with 1pt=pt(500,500)=ERR_VALUE | SEVIRI-based SF at GERB config.<br>Corrected Solar flux (L20_SF) | 3*3 pt.<br>“ | PASS |

- There are 3*3 GERB pixels which PSF area spreads onto one SEVIRI pixel.

**Test table for TF case :**

| Name of the file where an error is introduced | Name of contaminated images | Comments | Status of the test |
|---|---|---|---|
| L15_SW_19950702151737_01.rma with pt(100,100)=ERR_VALUE | computed GERB LW<br>Correction factor (C_TF)<br>Corrected Thermal Flux (L20_TF) | 1 pt.<br>1 pt.<br>1 pt. | PASS |
| L15_TW_19950702151500_01.rma with pt(100,100)=ERR_VALUE | None | (*) | PASS |
| L15_GEO_199507021500_01.ims with pt(100,100)=ERR_VALUE | computed GERB LW<br>SEVIRI-based LW at GERB config.<br>Correction factor (C_TF)<br>Corrected Thermal Flux (L20_TF) | 1 pt.<br>1 pt.<br>1 pt.<br>1 pt. | PASS |
| GLWE_19950702151500_01.rma with 1pt=pt(500,500)=ERR_VALUE | SEVIRI-based LW at GERB config.<br>Correction factor (C_TF)<br>Corrected Thermal flux (L20_TF) | 3*3 pt.(*)<br>"<br>" | PASS |
| GTFE_19950702151500_01.rma with 1pt=pt(500,500)=ERR_VALUE | SEVIRI-based TF at GERB config.<br>Corrected Thermal flux (L20_TF) | 3*3 pt.<br>" | PASS |

Comments :

- Geolocation interpolation avoid to use point (100,100).

**Status of the test : PASS**

# 5 Test of output files storage on disk

**Purpose of the test:**

Test final files storage on disk.

**Methods:**

We check, after program running, that all the output images are saved on disk and can be re-read with the "viewrma" application.

**Test table for SF case :**

Input reference date : 19950702151737

| Output data | Name of the saved files | Status |
|---|---|---|
| Corrected solar fluxes | L20_SF_19950702151737_01.rma | Exists |
| Correction factor | C_SF_19950702151737_01.rma | “ |
| Seviri_based solar fluxes at GERB column time | SevB_SF_19950702151737_000.rma | “ |
| | SevB_SF_19950702151737_001.rma | “ |
| | SevB_SF_19950702151737_ “ .rma | “ |
| | SevB_SF_19950702151737_255.rma | “ |

**Test table for TF case :**

Input reference date : 19950702151737

| Output data | Name of the saved files | Status |
|---|---|---|
| Corrected solar fluxes | L20_TF_19950702151737_01.rma | Exists |
| Correction factor | C_TF_19950702151737_01.rma | “ |
| Seviri_based solar fluxes at GERB column time | SevB_TF_19950702151737_000.rma | “ |
| | SevB_TF_19950702151737_001.rma | “ |
| | SevB_TF_19950702151737_ “ .rma | “ |
| | SevB_TF_19950702151737_255.rma | “ |

**Status of the test : PASS**

# 6 Material requirement test

## 6.1 Objective

These tests on GERB processing are aiming to estimate computing time, memory and disk space needed to store output data.

## 6.2 Input data derived from Meteosat 7 data.

We try here to simulate more realistic images by using Meteosat 7 data in stead of artificial rectangles scenes. Let's distinguish 4 simulation steps :

First, radiances values, fluxes values and ADM coefficients are derived from Meteosat 7 data using the “RMIB SEVIRI processing”, converted to “rma” images of size 833*853, and stored in directory “/raindata/meteosat”.

Secondly, these images are interpolated to get SEVIRI size images (1233*1233)

| image 833*853 | ->IP_ImageResize-> | image 1233*1233 |
|---|---|---|
| rad_sol_1300.rma.gz | | rad_sol_13_12.rma |
| flux_sol_1300.rma.gz | | flux_sol_13_12.rma |
| adm_1300.rma.gz | | adm_13_12.rma |

Third, simulated GERB images are generated by down sampling of Eumetsat images 1233*1233 at GERB geolocations with a square PSF area of size 15*15.

| SEVIRI image | ->convolution-> | GERB image |
|---|---|---|
| rad_sol_13_12.rma | | gerb_SW_13_256.rma |
| flux_sol_13_12.rma | | gerb_SF_13_256.rma |

Fourth, from ideal SEVIRI images, we derivate 3 different slightly perturbed images :

| test | "ideal"SEVIRI | ->perturbations-> | simulated SEVIRI | reference date |
|---|---|---|---|---|
| | | cS={0.8->1.2} | | |
| 0 | rad_sol_13_12.rma | according to ADM | rad_sol_pertu_0.rma | 19901225130237 |
| | flux_sol_13_12.rma | | flux_sol_pertu_0.rma | |
| 1 | rad_sol_13_12.rma | = linear fct of | rad_sol_pertu_1.rma | 19911225130237 |
| | flux_sol_13_12.rma | radiance | flux_sol_pertu_1.rma | |
| 2 | rad_sol_13_12.rma | =sinusoidal fct | rad_sol_pertu_2.rma | 19921225130237 |
| | flux_sol_13_12.rma | of radiance | flux_sol_pertu_2.rma | |

The GERB processing has been tested for 3 cases, launching the main program "testGP", with the following parameters :
interpol_PSFrot = 1 ;
nb_grcolumn = 5 ;
interpol_between4SeviriPixel = 0 ;
interpol_A = 1 ;
interpol_Theta = 1 ;
save_flag =1 ;
Launching command :

1. testGP 19901225130237 SF 15
2. testGP 19911225130237 SF 15
3. testGP 19921225130237 SF 15

### 6.3 Results

Processing one SF image request :

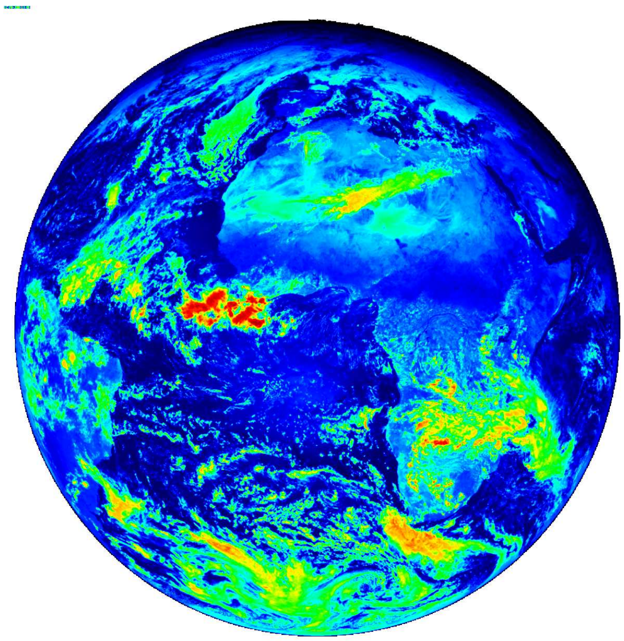
- Computation time : 53 s (For test computed on a PII 450 Mhz under Linux with gcc as compiler)
- Disk space used to store result data for next process, the Resolution Enhancement : 48 M

The stored data is described in the following table :

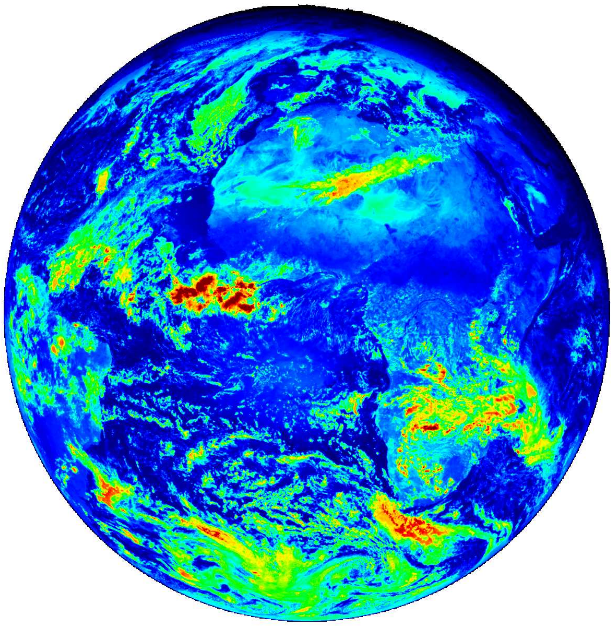
| Data description | file name | directory | size |
|---|---|---|---|
| SEVIRI band image at GERB column time | SevB_SF_<date>_<nb>.rma | GPtoRE/SeviriBand | 46847 K |
| GERB L2 flux | L20_SF_<date>_<v>.rma | L20_GERB/L20_SF | 262 K |
| Correction ratio at GERB resolution | C_SF_<date>_<v>.rma | GPtoRE/C_SF | 262 K |
| SEVIRI flux at low resolution | SlowR_SF_<date>_<v>.rma | GPtoRE/SlowR_SF | 262 K |
| | | TOTAL | 47633 K |

## 6.4 Examples of testing images derived from Meteosat 7

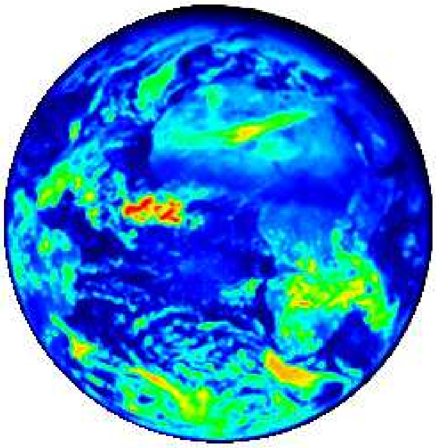
**Reference** fluxes image derived from Meteosat 7



**Simulated** SEVIRI image (flux_sol_pertu_0.rma)



**Simulated** GERB image (gerb_SF_13_256.rma)



# References

[1] L. Gonzalez, A. Hermans:"Gerb Processing", RMIB technical notes, MSG-RMIB-GE-TN-04,2000.

[2] A. Hermans:"Gerb Processing: program description", RMIB technical notes, MSG-RMIB-GE-TN-15,2000.