6   DETAILED DEFINITION OF L1 PRODUCTS

6.1   DEFINITION OF L1A PRODUCTS

⇨ This product L1A consists in generating brightness temperature (MADRAS/SAPHIR) or radiance (SCARAB) of the samples acquired on board in the instrument geometry along with geo-location, time of acquisition, and other relevant parameters and flags

⇨ Data is time tagged and geo-located.

⇨ Radiometric corrections (calibration factors) are applied on each sample.

⇨ Data are processed independently for each instrument

⇨ The product will be available as standard product and NRT product

⇨ Product will contain only complete scans

6.1.1   MADRAS L1A products definition

♦ Data will be processed independently per frequency channel 18,23,36, 89 and 157Ghz and per scan line, assuming that H & V channels of the same frequency have to be processed jointly to apply radiometric corrections (cross polarization)

♦ The L1A product is provided in the instrument geometry.

♦ The acquired geometry sample is dynamic, following scan geometry, orbit & attitude variations and other parameters

♦ All samples generated on board are processed for this product, even samples which are acquired over ± 65°. Limits are identified in the table section 3.1

♦ Along a scan line, samples of HF (157GHz), MF (89GHz) or LF (18/23/36GHz) channels are not collocated and do not have the same footprint size.

♦ As the samples of LF channels 18,23 and 36GHz are collocated , the latitude/longitude information is the same for the 5 channels

♦ The centre of the sample correspond the middle of the integration time.

♦ The shape of the sample footprint is an ellipse. Approximate dimensions are the following :

Sample Dimension	HF Channel (157GHz)	MF Channel (89GHz)	LF channels (18/23/36GHz)
Along track	10,1 Km	16,81Km	67,25Km
Across track	6.0 Km	10,0Km	40,0Km

Table 6.1-1: MADRAS footprint

⇨   Data are processed per scan line. Nevertheless, some calibration parameters are calculated using various consecutive scans

6.1.1.1 Content of MADRAS L1A file

♦ The following information will be included in the L1A file

See excel document ProductDefinition_MADRAS_L1A-1-1-2-3-B_HDFMGTStructure_13rev2.xls

6.1.2   SAPHIR L1A products definition

⇨ Data will be processed independently per channel except some calibration parameters which will be calculated over many scans

⇨ Due to SAPHIR geometry, 182 samples per scan line and per channels (6 channels) are processed.

⇨ Along the scan line, samples of all the 6 channels are collocated and have exactly the same footprint dimensions projected on ground as well the same geo-location.

⇨ Due to over-sampling of pixels by a factor of 1, 4 along the scan line, the following samples geometry is obtained .It can be noted that consecutive samples are overlapped
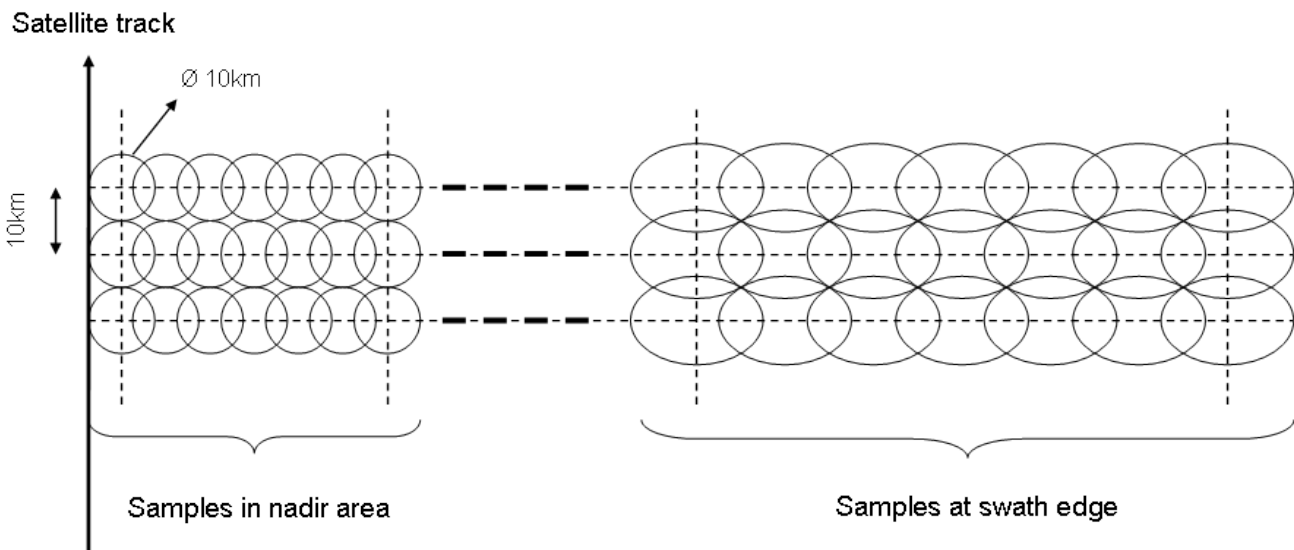

Figure 6.1-1: "Sample" geometry of Level 1-A product of SAPHIR

⇨ Footprints are elliptical in shape and footprint sizes are as follows :

Sample size on ground	Across track	Along track
At Nadir	10Km	10km
At the edge of the swath	22,7 Km	14,5 Km

Table 6.1-2: SAPHIR footprint

♦ In the L1 product, the centre of 182 samples footprints will be geo-located and time tagged. The footprint centre correspond to the middle of the integration time.

♦ The acquired geometry sample is dynamic, following satellite attitude variation.

♦ Data are processed per scan line. Nevertheless, some calibration parameters are calculated using a few consecutive scan lines

6.1.2.1   Content of SAPHIR L1A file

♦ The following information will be included in the SAPHIR L1A file
See excel document ProductDefinition_SAPHIR _L1A-1-1-2-3-B_HDFMGTStructure_13rev2.xls

6.1.3   SCARAB L1A products definition

♦ Data will be processed independently per channel and per scan line. However, some calibration parameters are determined using various consecutive scans.

Scanning pattern on ground

The following figure shows the IFOV footprints and the sampling of the earth surface (values on the figure correspond to current nominal calculated values and are provided for information only).
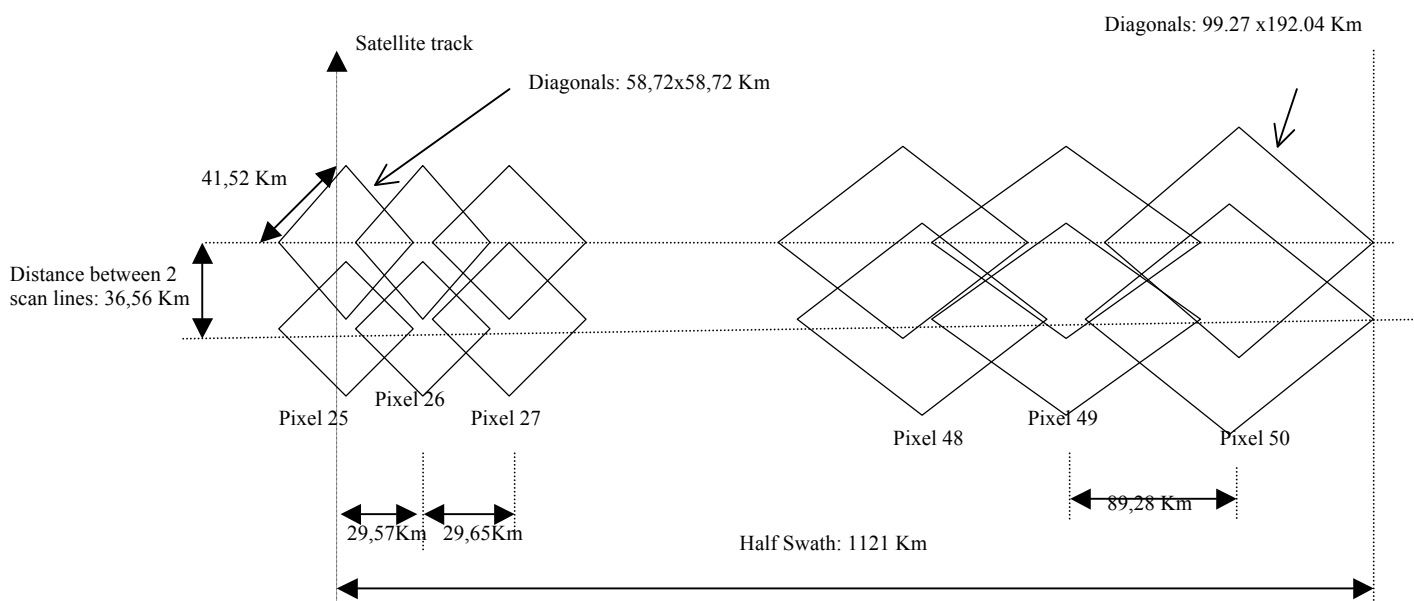

Figure 6.1-2: "Sample" geometry of Level 1-A product of SCARAB

- The sample center is located in the middle of the integration time.

- 51 samples per channels and 3 samples for cold sky for each channels during scan.

- The acquired geometry sample is dynamic, following satellite attitude variation.

- Data are processed per scan line. Nevertheless, some calibration parameters are calculated using a few consecutive scan lines.

- In fact, the location of the 51 measured radiances values will be calculated at the top of the atmosphere : 20km above the surface and also at the surface.

6.1.3.1   Content of L1A SCARAB File

The content is described in the following document :
See excel document ProductDefinition_SCARAB _L1A-1-1-2-3-B_HDFMGTStructure_13rev2.xls

6.2   GENERAL DEFINITION OF L1 A2 PRODUCTS

- This product L1A2 consists in generating brightness temperature of pixels for MADRAS and SAPHIR radiometers. Pixels are defined as non overlapping synthetic footprints covering the scan swath. (Refer to section 3).

- For each instrument, using the instrument radiometric samples (L1A data), re-sampling of L1A data along the scan is performed to generate pixels.

- Pixels are provided in the instrument geometry.

- Data are time tagged and geo-located.

- Data are processed independently for each instrument

- The product will be available as standard product and NRT product.

6.2.1   Definition of MADRAS L1A2 product

- Data are processed independently per scan line.

- The re-sampling of L1A data is performed in order to provide on each scan line, collocated pixels for all the channels taking as a reference the actual position of MADRAS 89Ghz pixels. MADRAS other channels data pixel centers shall be located at the exact location of 89GHz MADRAS pixels centers.