

CNES programmes for Meteorology, Climate and Atmospheric composition

Thierry PHULPIN, D. RENAUT, A. LIFERMANN
and C. LARIGAUDERIE

21 mars 2012

ITSC-18
Meteo France



IASI

- IASI on Metop-A

IASI is still working very well. The performances remain excellent and very stable (see presentation of E. Pequignot, CNES). No sign of ageing effect, carefully monitored by TEC (see poster of J. Chinaud 26 atmospheric gases isolated in IASI data, thanks to its performances and low noise. These species contributes to know more about chemical atmospheric composition (see poster)
IASI chosen by GSICS as a reference for calibration of infrared sensors

- IASI on Metop-B

Now at Baikonour, waiting the launch. Functional test successful.

Since last TV test, we know that performances should be similar to IASI/METOP-A

Launch : 23 May 2012

Commissioning from 26th of May to first week of July, followed by CAL/VAL. For this CAL/VAL

IASI/METOP-B will be calibrated with IASI/METOP-A (see poster of D. Jouglet, CNES, presentation of E. Pequignot, CNES).

Early dissemination foreseen for September 2012.

- IASI on Metop-C

Now in TAS, waiting re-integration on PLM module. Scan “anomaly” fixed, no impact on IASI/METOP-B

- 3rd IASI conference : In February 2013, venue to be decided

PARASOL

- Parasol, launched on 18 Dec 2004, in operation for 7 years with 5 years of formation flying in the A-Train
- Heritage of POLDER, the instrument is a multichannel, multiview polarimeter
- 'operationnal' monitoring, data processing and data delivery to users
 - ◆ Level 1 : by CNES <http://smc.cnes.fr/Parasol>
 - ◆ Level 2&3 : by ICARE <http://icare.univ-lille1.fr>
- Aerosols parameters
 - **detailed microphysics** for Air Quality and speciation : **fine** vs **coarse** mode, **spherical** vs **non spherical**
 - ◆ Over ocean : ability to discriminate between fine mode (pollution or biomass burning), spherical coarse mode (maritime), non-spherical coarse mode (dust) :
(total optical thickness, Angström exponent, Non Spherical optical thickness, spherical fraction)
 - ◆ Over land : unique access to fine mode optical thickness and Angström exponent from polarization measurements
 - ◆ Over clouds : unique capability (in preparation)
- Cloud parameters
 - ◆ Cloud fraction
 - ◆ Cloud phase (from polarization measurements)
 - ◆ Cloud optical thickness
 - ◆ Cloud pressures (top, Rayleigh)
 - ◆ Cloud geometrical thickness
 - ◆ Total water vapor (differential absorption method)
- A Parasol follow-on named 3MI (Multispectral Multidirectional Multipolarized Instrument) is foreseen on EPS-SG to provide operational aerosol monitoring

More information at
<http://www.icare.univ-lille1.fr/parasol/>
and also Parasol User workshop
presentations http://www.icare.univ-lille1.fr/highlights/symposium_2010/

MEGHA-TROPIQUES

- MT was launched by ISRO from Sriharikota (India) on 12 October 2011 with the Indian PSLV launcher. The satellite has been put on its 20° tilted orbit at 865 km altitude
- MT payload is composed of the instruments Madras, Saphir, Scarab and GPS-ROS.
- MT was developed in a cooperation between CNES and ISRO. CNES provided Saphir and Scarab, and Marfeq, the microwave heart of Madras.
- In March 2009, CNES decided to contribute to the ground reception of data from the satellite through its stations of Kourou and Hartbeesthoek in order to enable the nearly real-time distribution of Megha-Tropiques data.
- CNES is in charge the Expertise Centre. Commissioning has be started on 14 October.
- Reception in CNES stations for NRT applications. Data will also be received at Eumetsat, which is preparing the signature of an agreement with CNES and ISRO to receive and redistribute NRT Megha-tropiques data.

SAPHIR

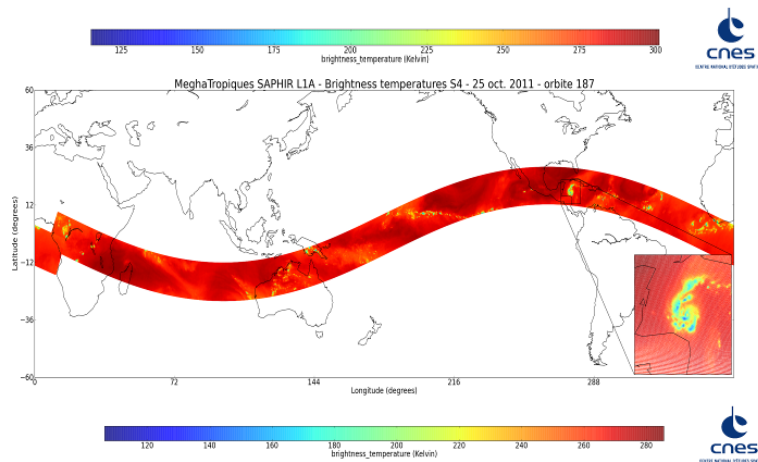
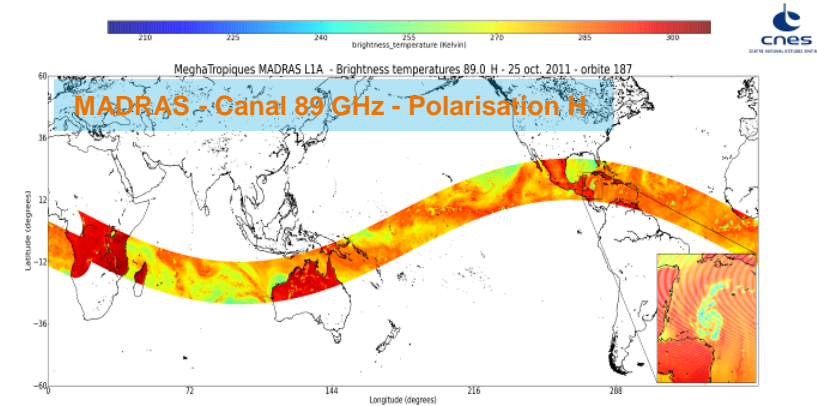
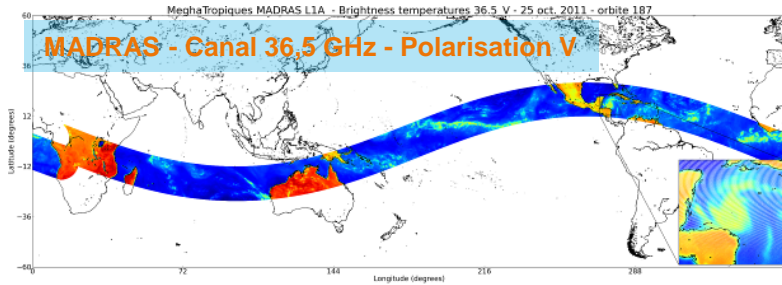
SAPHIR & AMSU-B CHANNEL SPECIFICATIONS

Channel No.	SAPHIR Central Freq. (GHz)	*SAPHIR Freq. used (GHz)	*AMSU-B Freq. (GHz)
1	183.31±0.15	183.16	----
2	183.31±1.20	182.11	182.31 (B5)
3	183.31±2.80	180.51	180.31 (B4)
4	183.31±4.30	179.01	----
5	183.31±6.60	176.71	176.31 (B3)
6	183.31±11.00	172.31	----
*Earlier version Latest specifications have minor deviations			*Other channels are 89 & 150 GHz

MADRAS

Channels	Polarisation	Cross Track Resolution	Sensitivity	Science Parameters
18.7GHz	H+V	40km	0.7K	Rain above ocean
23.8GHz	V	40km	0.7K	Integrated water in clouds, rain
89GHz	H+V	10km	1K	Convective rain area
157GHz	H+V	6km	2.6K	Ice at cloud tops

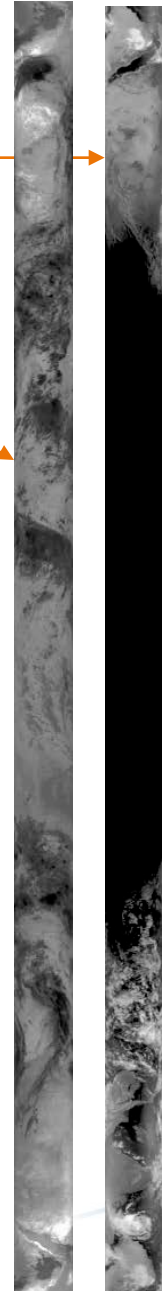
SOME FIRST RESULTS WITH MT



SCARAB - Canal 2 (0,2-5 μm)

SCARAB - Canal 4 (10-13 μm)

More on the poster



IASI-NG

- IASI-NG is the CNES instrument designed to meet the requirements given by Eumetsat and the french scientific community for the next generation of EPS. It is also compliant with GMES
- It will have similar geometrical characteristics than IASI, but radiometric performances and spectral resolution twice better.
- End of Phase A review is on-going. Two industries were in competition. They proposed very different designs. ITT for phase B will be released by end of spring. The selection will be made by end of the year.
- CNES will have to confirm its commitment on the delivery of three (TBC) flight models in April 2012
- Cooperation agreement with Eumetsat is in preparation
- Many scientific studies performed by the science group MENINGE to consolidate the requirements (see Crevoisier).

More on the poster