IASI-New Generation Program : Status Overview

F. Bermudo, E. Jurado, C. Lefèvre, A. Deschamps, C. Luitot , F. Bernard, S Guibert

Centre National d'Etudes Spatiales (Toulouse, France)

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IASI NG
Un regard plus précis sur l'atmosphère terrestre

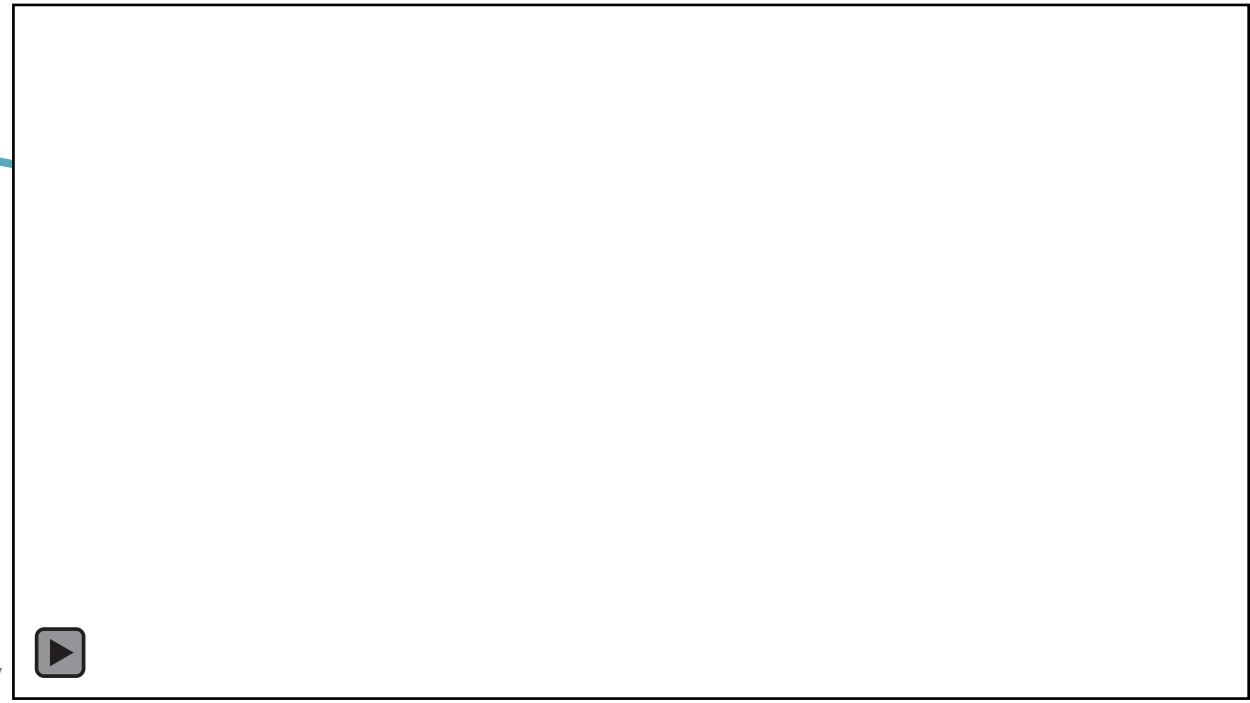
Summary

- CONTEXT OF IASI-NG PROGRAM
- INSTRUMENT CONCEPT AND STATUS
- GROUND SEGMENT STATUS
- GLOBAL SCHEDULE STATUS

IASI-NG

part of Eumetsat Polar System SG Program

- **IASI-NG instrument will be embarked on Metop SG-A Satellites series**
  - Operational observations from the early 2020's to mid-2040's timeframe with 3 successive flight models
- **IASI-NG will provide measurements from polar orbit for numerical weather prediction, atmospheric chemistry and climate monitoring.**
- **With respect to the IASI first generation, this New Generation will ensure continuity of operational observations and with improvement of some essential performances measurement**



IASI-NG

part of Eumetsat Polar System SG Program

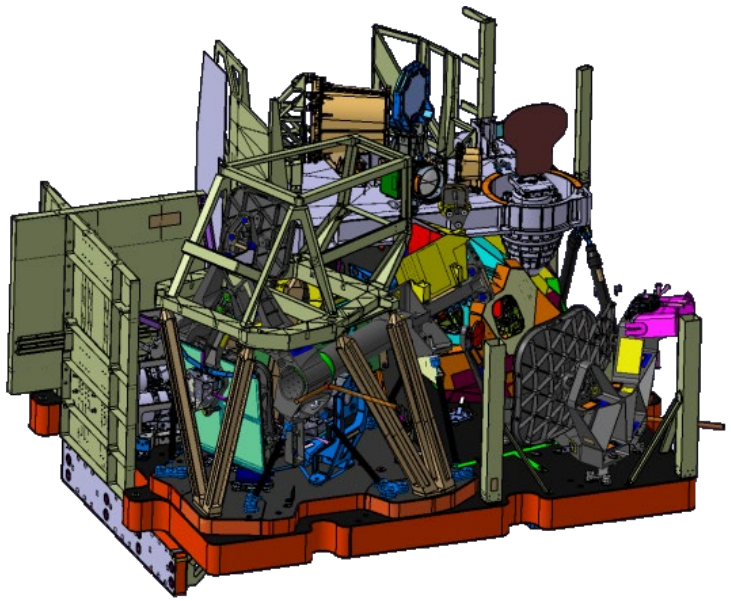
- **Improvement of some essential performances measurement allowed by new instrumental concept : first implementation in space of a Mertz Interferometer**
- **Mertz concept : optical compensation of the field effects by putting in the optical path a refractive material which thickness changes with the OPD**

SPECTRAL RESOLUTION	0.25 cm-1 (2 times better than IASI)
SPECTRAL SAMPLING	~17000 Spectral Channels (2 times better than IASI)
RADIOMETRIC NOISE	NedT ~ 0.1K (2 times better than IASI)
RADIOMETRIC CALIBRATION	NedT ~ 0.25K (2 times better than IASI)
SOUNDING PIXEL SIZE DIAMETER	12 km (same than IASI)

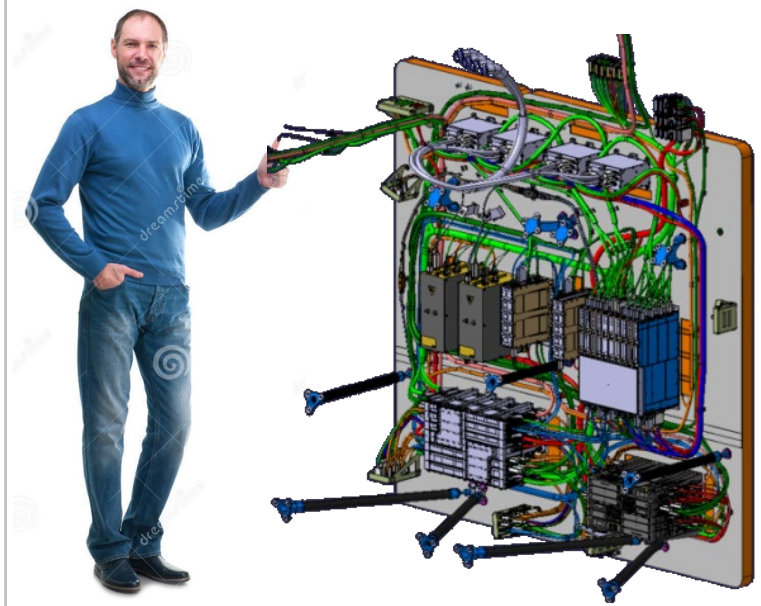
Industry

IASI-NG Program

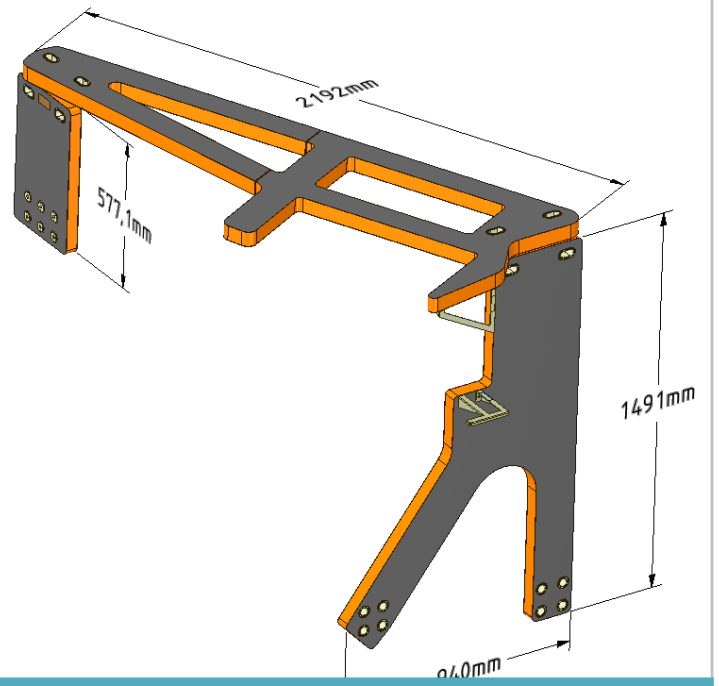
Instrument Main Units



Optical Head (I-OH)



Electronics Module (I-EM)

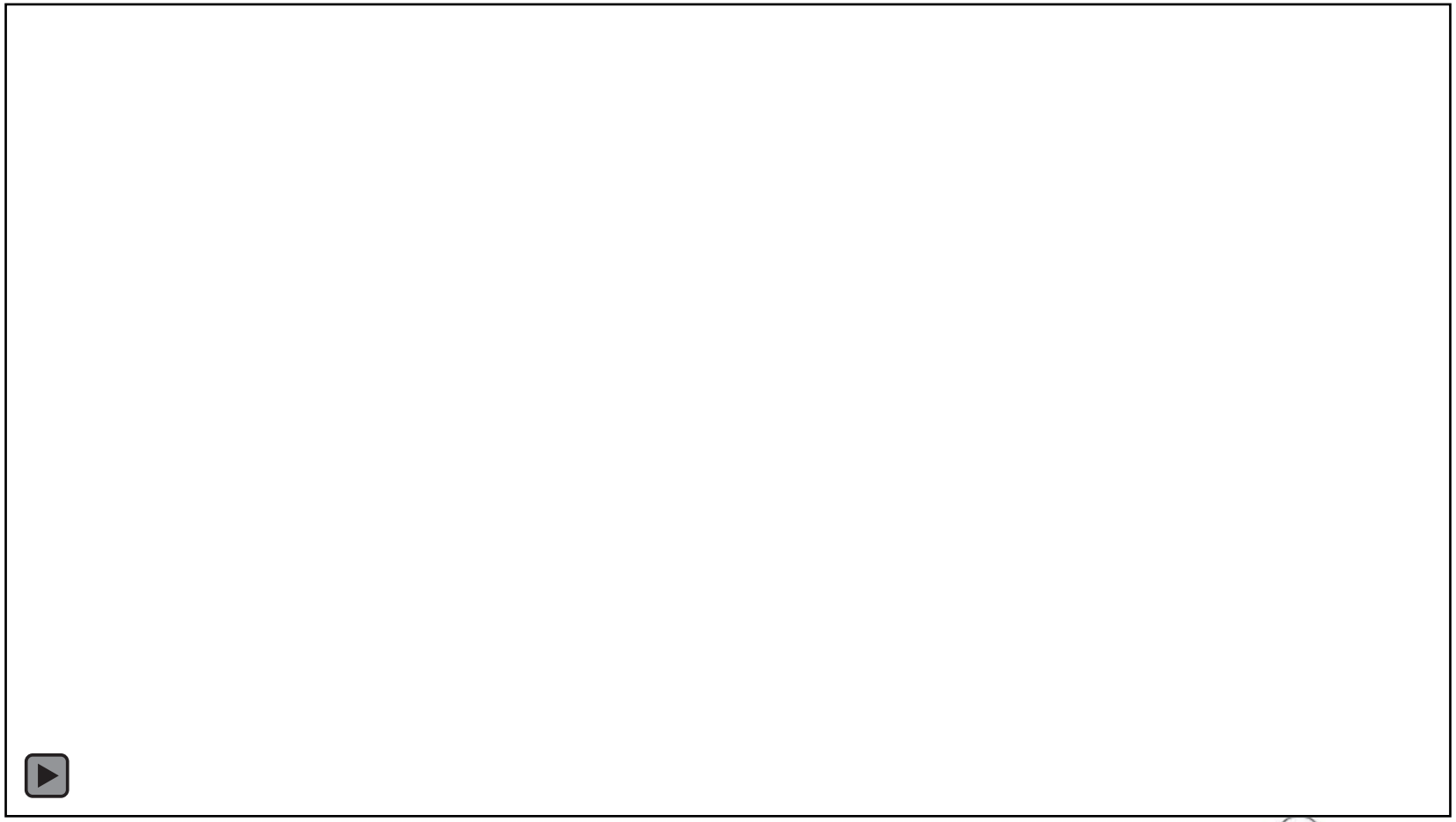


Sunshield

IASI-NG Program

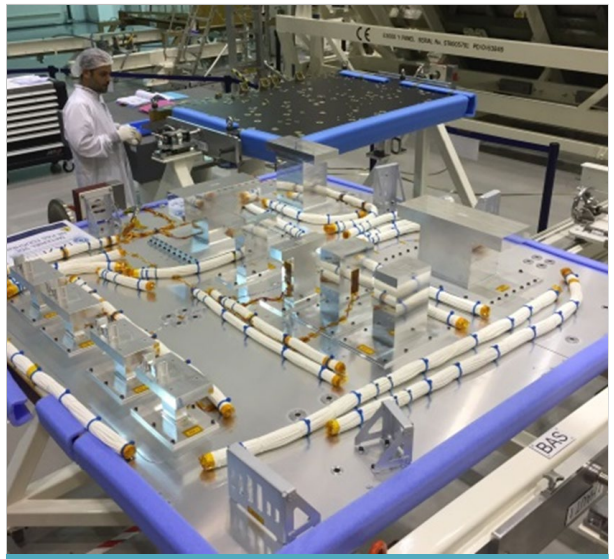
Instrument Main Units

- IASI-NG takes series of 14 atmospheric measurements. The incoming beam is reflected off the mirror of the scanning mechanism.
- **Mertz interferometer** : synchronisation between the optical path difference and the variation in thickness of the glass to compensates the field effects is ensured by an unique mechanism.
- **Cryostat** contains the infrared detectors : optical beam entering contains the infrared spectrum from 3.6 to 15.5 microns then beam is separated into four spectral bands, each assigned to a different sensor.



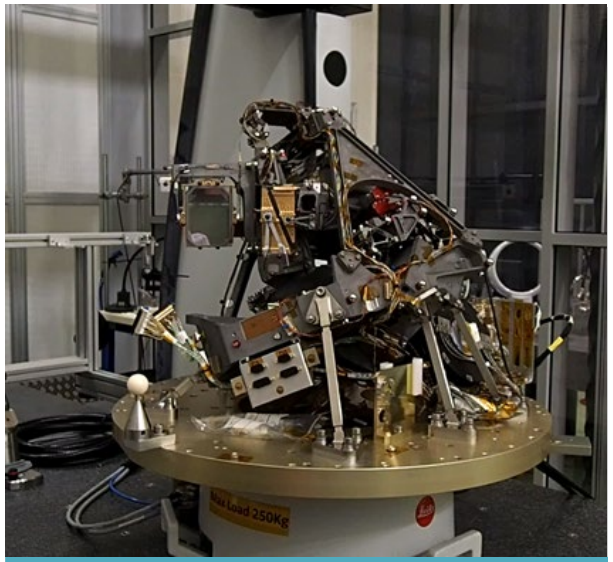
IASI-NG Program

Instrument Engineering Model Tests on going

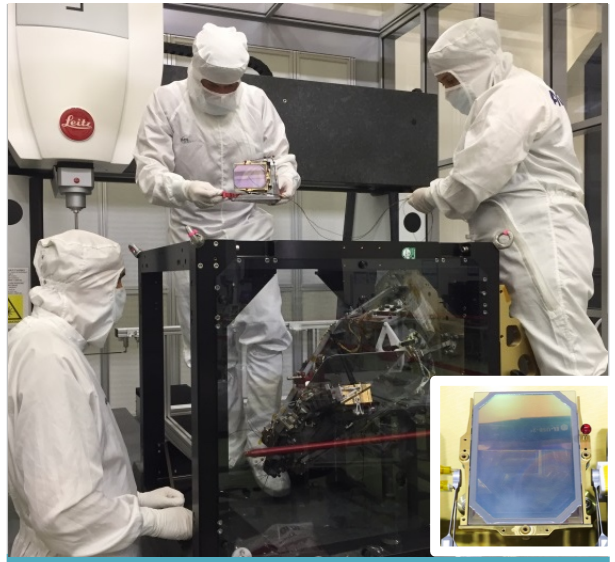


Electronics (foreground) and Optical Head Module(back ground)

Electronics : ICPU-MVU-4FEE-2DET

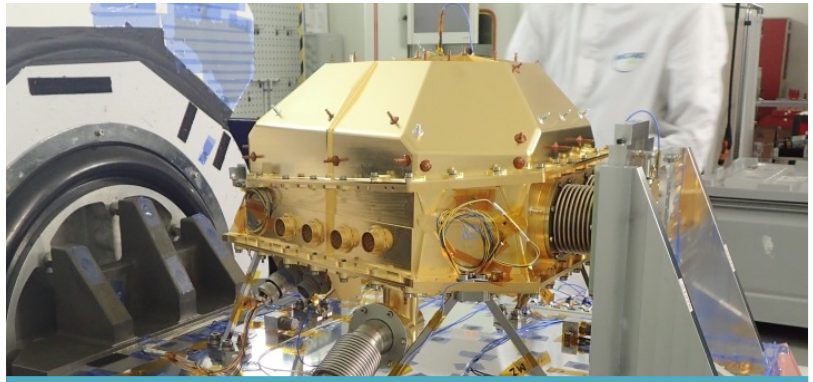


Interferometer after alignment : Pivot locations and axes are aligned within 5 microns

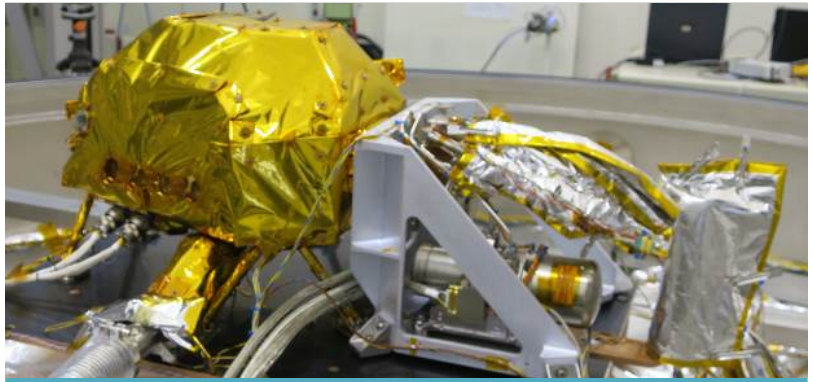


IFM Potassium Bromide Prisms integration

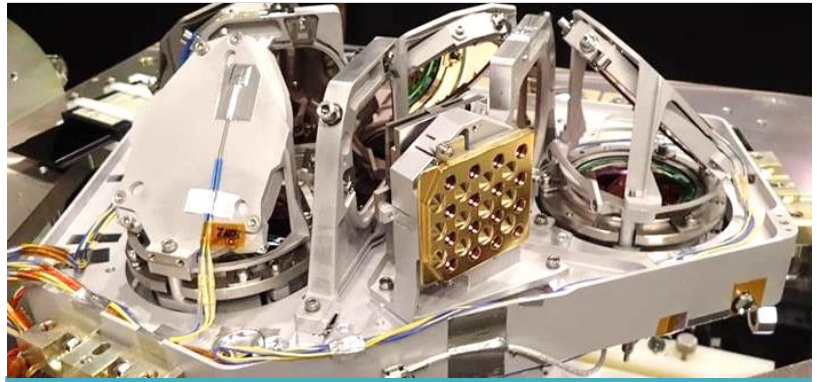
Instrument Engineering Model Tests on going



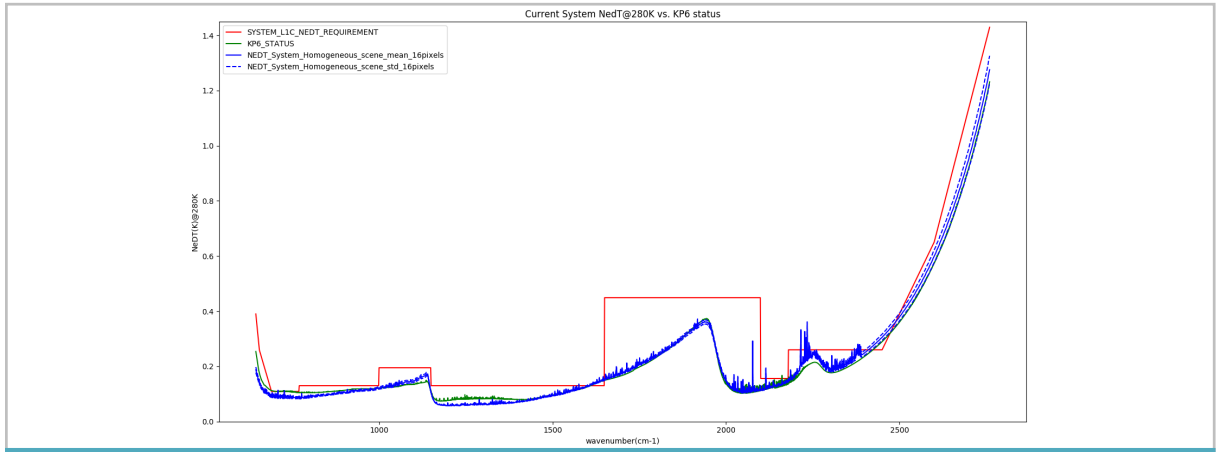
Cryostat under vibration testing



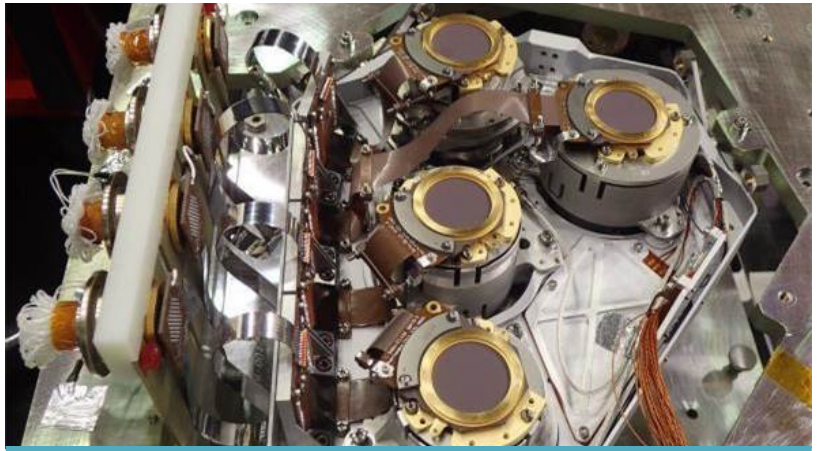
Equipped cryostat under thermal vacuum testing



Optical Bench with Dichroics, Folding Mirrors and Pupil Imaging Optics.



Preliminary mission radiometric performances assessment (WC)



Optical Bench with IR Detectors

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Ground segment Status

- **L1C POP Processing**
  - On-board processing : only goal is to compress the data transmitted on-ground
  - On-ground processing to
    - Correct the imperfections of the instrument (i.e. fully calibrate the data, spectrally and radiometrically)
    - Uniformize the provided spectra (i.e. an unique Spectral Response Function, for all channels and all pixels)

    OGP Science

    - Geo-localize the sounder pixels and Give information about the scene description inside the pixel FOV (radiance classification)

    OGP Image

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Ground segment Status

- **L1C POP Preliminary Definition Review successfully held with industry end of 2018 :**
  - Preparation of Algorithm Theoretical Basis Documents (ATBD) by CNES : completed for V1 (partial processing) et provided to industry , algorithms defined and under validation for V2 (full processing) to be provided in Q2 2020
  - Algorithm translations to design architecture of the Product Generation started for V1 relevant with the EUMETSAT Payload Data Acquisition and Processing (PDAP) infrastructure

- **Technical Expertise Center (IASTEC) : functional break-down outlined, constitutes the basis for the coming preliminary design architecture**

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Global Schedule Status

TODAY

CDR System Q1 2020

L1CPOP V1 2020

L1CPOP V2 2022

IASTEC 2022

METOP-SG-A LAUNCH Q4 - 2022

2017	2018	2019	2020	2021	2022	2023
Phase C Q2 2015 –Q4 2019			**Phase D** Q1 2020 – Q1 2023			**Phase E1 Cal/Val**

Delivery STM Q1 2019

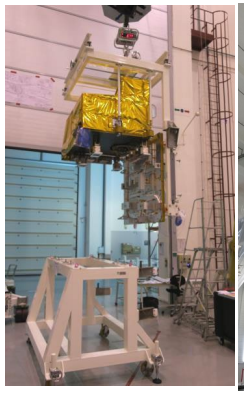
CDR Instrument Q4 2019

Delivery EM Q3 2020

Delivery PFM Q1 2021

Delivery FM2 Q2 2022

Delivery FM3 Q2 2023



IASI-NG STM on Metop SG STM

AIT Satellite Metop SG A - Q1 2021 – Q4 2022

To be embarked (after adaptation) either on plane either on stratospheric balloon for validation measurement campaigns pre and post launch.

Merci
for your attention !

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