Mission Status

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INAF IAPS

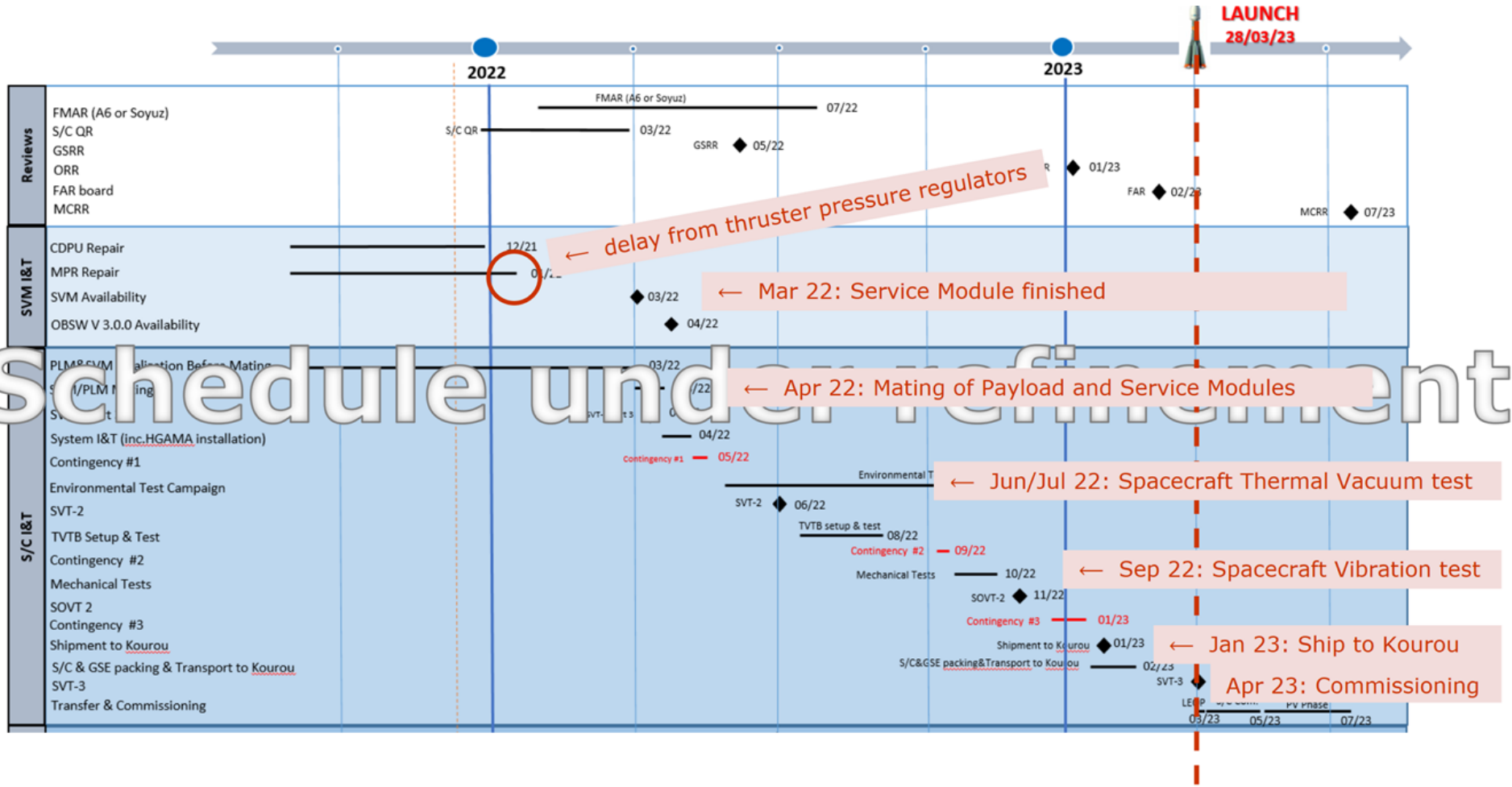
Meeting Nazionale Collaborazione Euclid 2022

23 - 25 Febbraio 2022

Presentation outline

- Schedule
- 2021 activities
- PLM and Thermal Vacuum Tests
- SVM status
- Ec management changes

Schedule



EC Main activities since March 2021

- VIS and NISP performances at CSL
- EC SGS : and continued with a very successful
  - Ground Segment Implementation Review (GSIR) close out passed successfully
  - Completion of SC8
  - Spacecraft Validation Test (SVT), a test under the responsibility of ESOC connecting Mission Control to the spacecraft, with the involvement of the Science Ground Segment, both SOC and the IOTs: long mission scenarios were run simulating various on-orbit phases. The test campaign was successfully completed Nov. 2021
- ECSURV: RSD optimised

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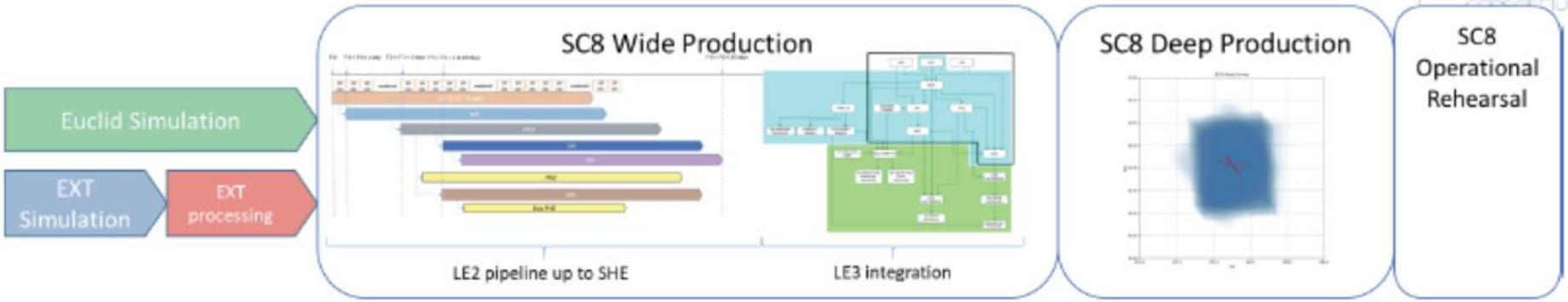

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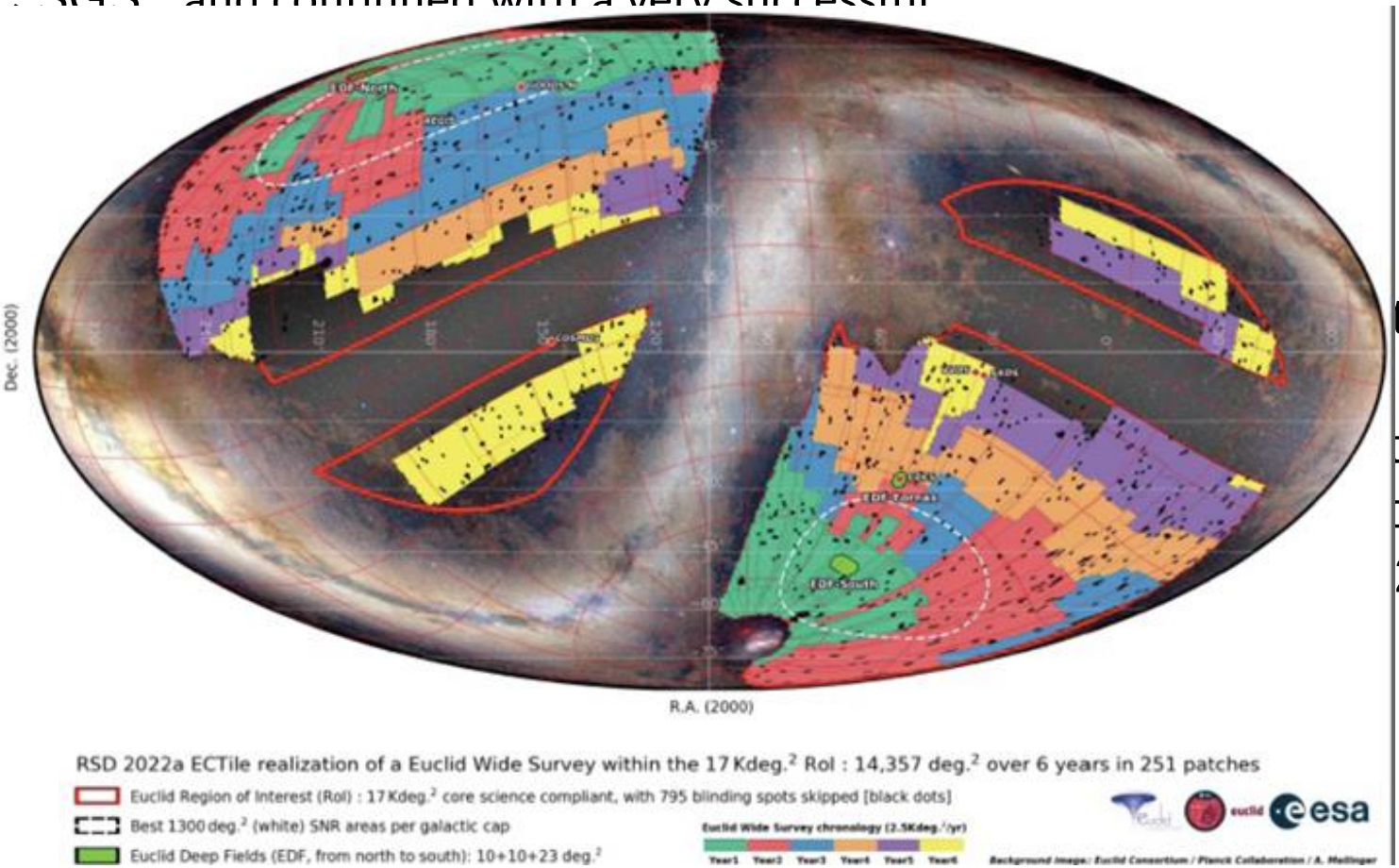


EC Main activities since March 2021

- VIS and NISP performances at CSL
- EC SGS
- ECSURV: RSD optimized
- SWG:
  - PSF characterization during the e2e tests at CSL confirmed that PSF and Completeness/purity requirements are still valid and can be met
  - SWG: Flagship simulation FS 2.0 (wide) close to completion
- IST: BlueGrism team set and started to work

EC Annual Meeting: Oslo Apr 26-29, 2022, Garage Day on Apr 25.

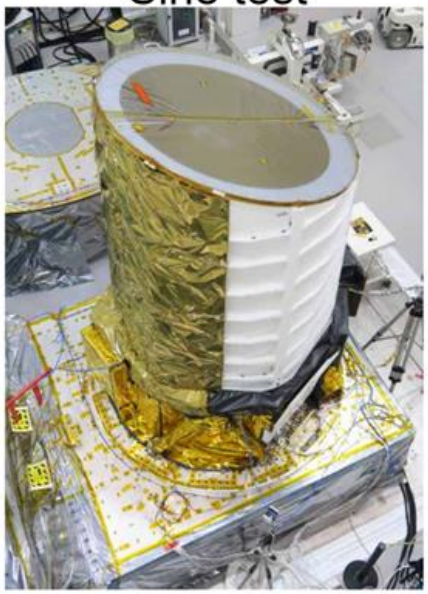
Payload Module Integration Status

PLM has been completely integrated and tested:

- PLM conducted ElectroMagnetic Compatibility test performed, including NISP Sensor Chip System susceptibility test;
- PLM vibration test (sine + acoustic) completed successfully;
- The e2e PLM test has been completed, globally successfully;

The noise levels generated at launch can reach levels up to 150 decibels (dB) or higher inside the fairing and cause structural damage of instruments and subsystems.
→spacecrafts shall be qualified for acoustic loading The whole satellite is tested and exposed to acoustic pressures expected during lift-off and subsequent mission phases.

Sine test



Acoustic test

PLM test campaign completed on Sept. 28th, 2021

PLM arrived in TAS-I on Oct. 7th, 2021

AIRBUS
DEFENCE AND SPACE

Thermal Vacuum Tests

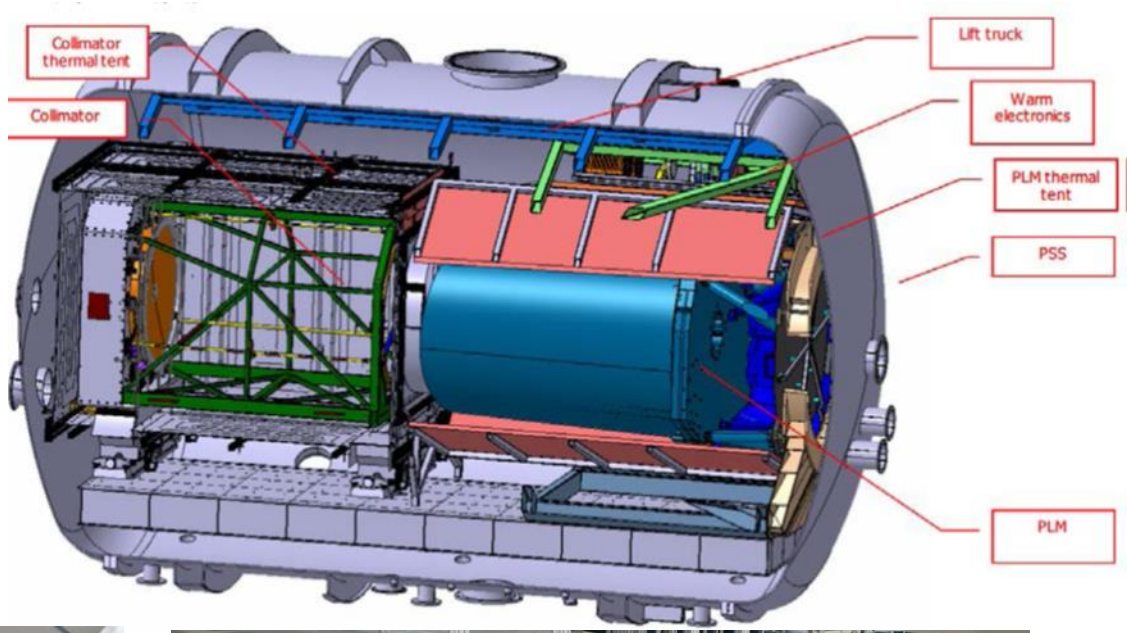
Thermal vacuum testing simulates a space environment, by removing air and pressure and cycling very high and very low temperatures.

The test simulates the temperature changes the satellite will encounter in space, as well as worst case scenarios of whether the instruments can come back to life in case of a shut down that exposes them to even colder temperatures.

- **Thermal vacuum tests (TV): Thermal function tests** in high vacuum conditions, both of complete systems and individual thermal control sub-systems at changing temperatures.
- **Thermal balance tests (TB): Thermal equilibrium** tests in the vacuum with different temperature levels allowing the verification of thermal model calculations.
- **Thermal vacuum cycling tests (TC):** Tests that expose the test item to a certain number of temperature cycles with a given minimum and maximum temperature as well as with pre-defined holding times and temperature ramps.

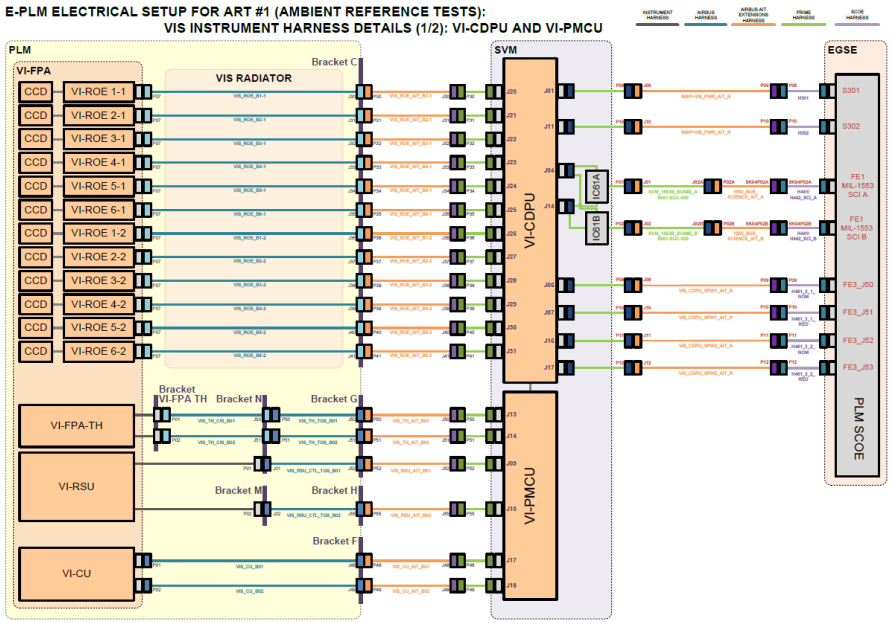
Thermal Vacuum Tests

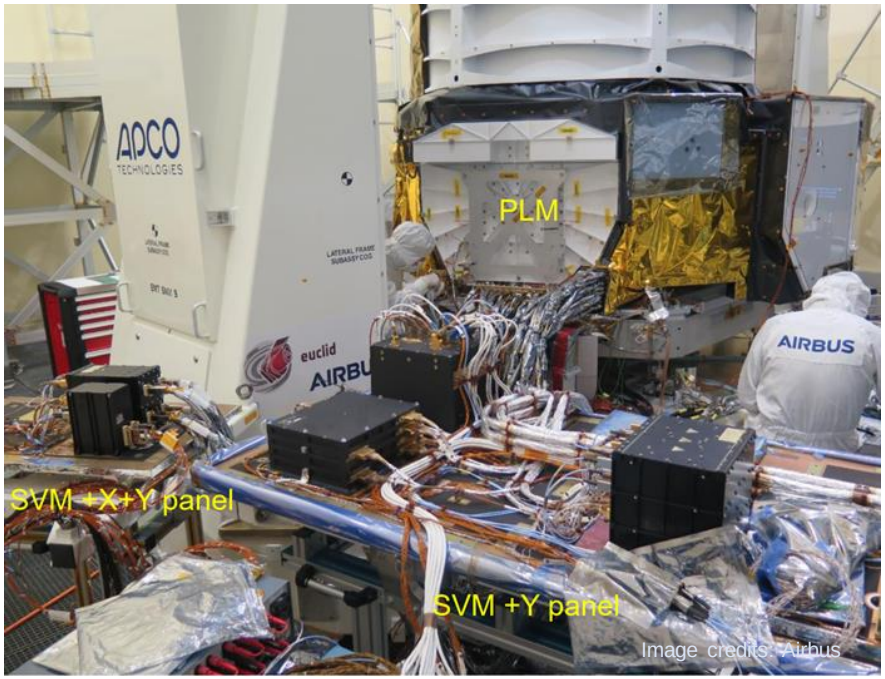
Test configuration:
collimator VS PLM

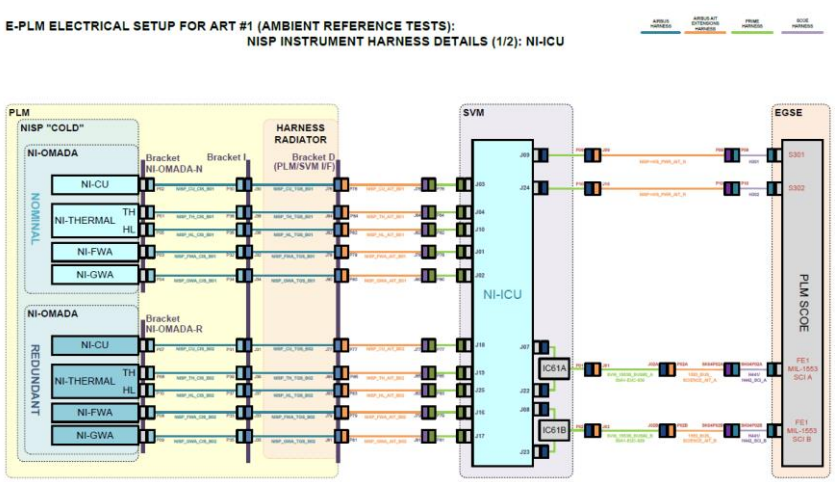


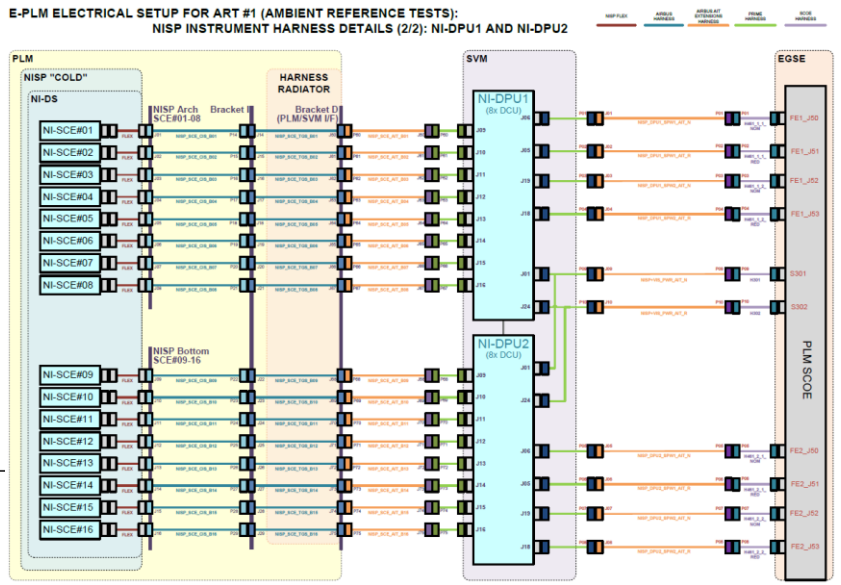
Collimator and PSS with PLM thermal tent on the Focal 5 optical bench during blank test preparation

Electrical configuration

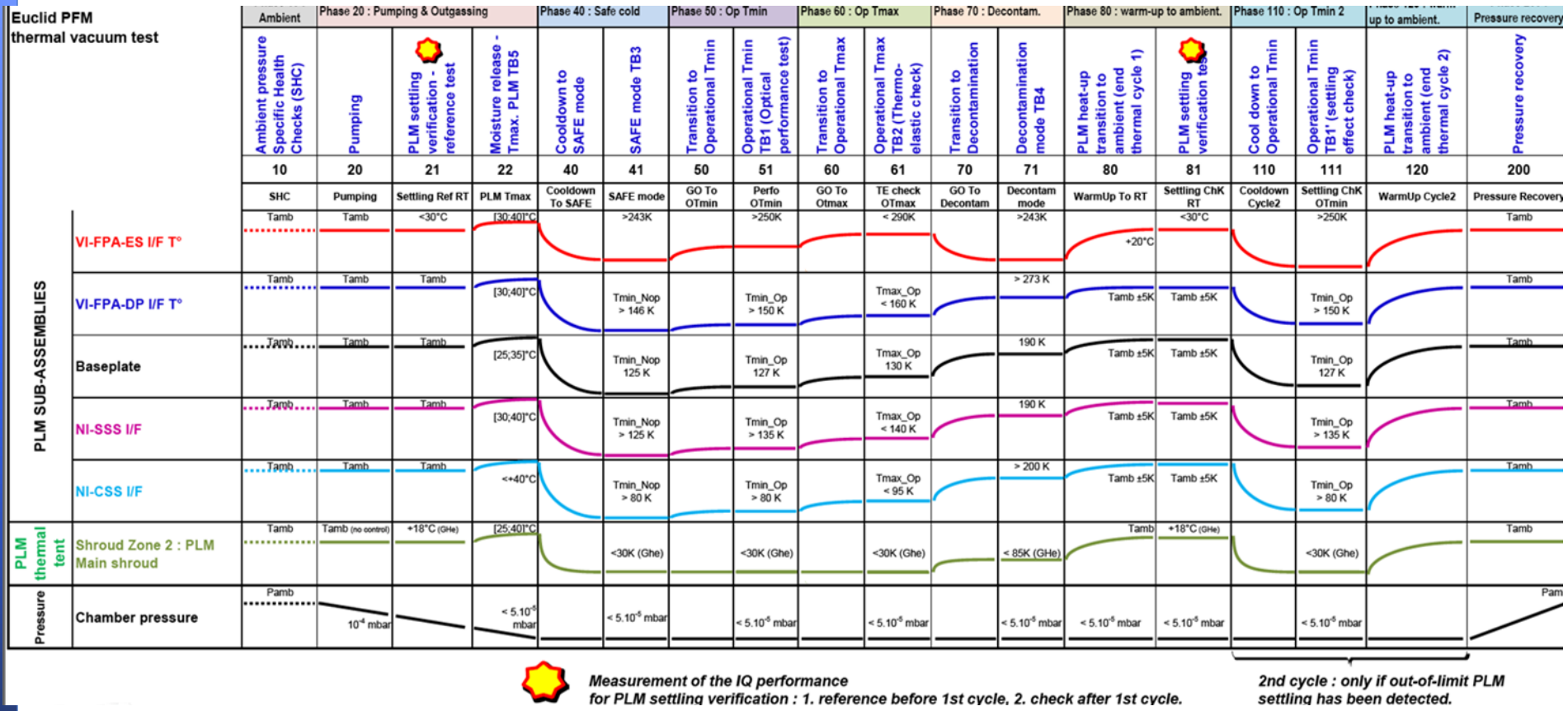






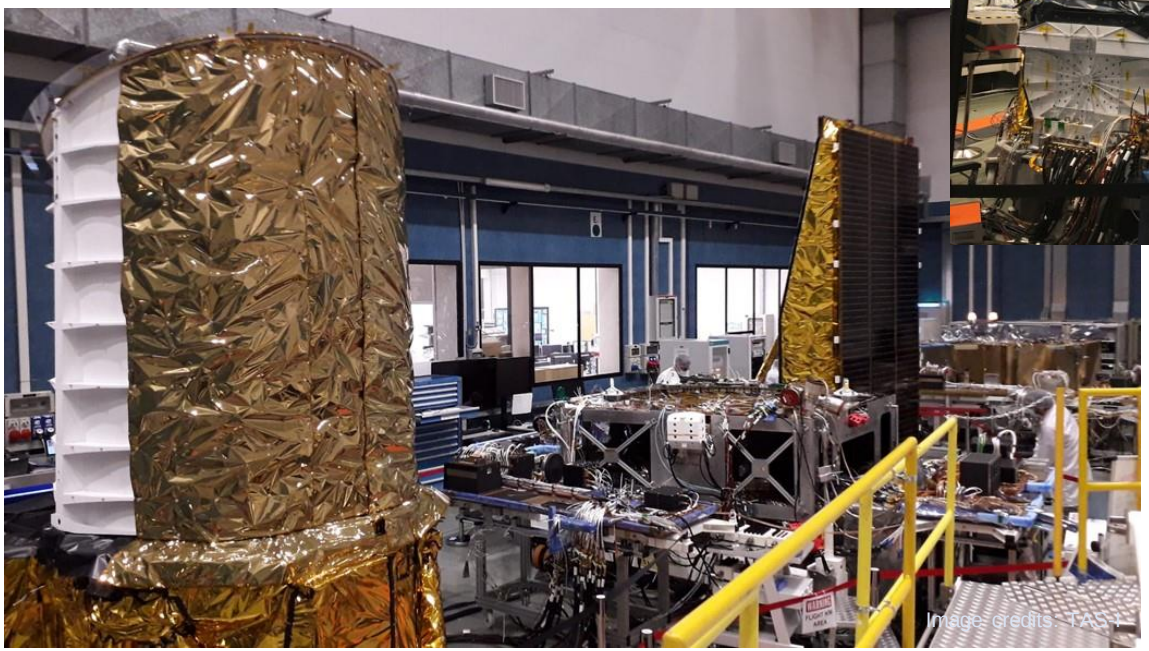


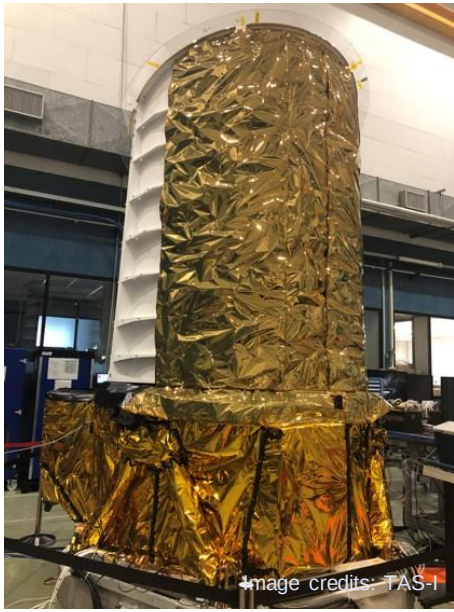
TBTV thermal phases – temperature profile



Spacecraft at TAS-I

Sunshield and solar array





PLM

Service Module Integration Status

Avionics Model (AVM) : All Engineering Model (EM) subsystem tests completed

Flight Model (FM):

- All FM equipment's delivered;
- Subsystem testing largely completed;
- Micropropulsion pressure regulator (MPR) leakage: last MPR delivered, testing started

SVM (with open panels)
Image credits: TAS_I

System Operation Validation Test-1 (SOVT-1) successfully completed: ESOC/SOC/Spacecraft/ IOT involved.

Reference Observation Sequence run uninterrupted, calibration with instruments, science data and HouseKeeping ingested in SOC;

Instrument Status

VIS:

VIS ReadOut Electronics ROE7 status: no failure occurred during the E-PLM e2e test; ***VIS ROE will be used as is;***

VIS ReadOut Shutter Unit lifetime test successfully completed;

VIS CDPU (Control and Data Processing Unit) failure to switch on the VIS PMACU (Power and Mechanisms Control Unit) at cold (-20ºC) - CDPU shipped to OHB-I for analysis and repair on September 28th. Failure cause isolated but not completely understood; electronic boards refurbished and tested. CDPU with replaced boards shipped to TAS-I in Dec 2021 but some analysis of the circuit are still on going to understand the temperature dependance.

NISP:

NISP Instrument Control Unit HW fix to anomaly in home sensor search at cold (resistor in harness)

NISP communication issue (9/16 of NIR detectors did not work during the E-PLM e2e test). SW Bug fixed

NISP DCU HW issue detected on one component (design level). Units refurbished, presently under testing.

SVM/PLM/Instrument/Mission summary

- PLM test campaign successful:
  PLM+ instruments at TAS-I
  integration and test activities started

- **VIS and NISP performances tested during the PLM test show excellent performances (as good or better than requirements)**

- Still to check:
  VIS Motor Power Supply/CDPU modelling
  NISP DPU/DCU tests after boards refurbishment

- Micropropulsion pressure regulators leakage problem solved
- Ice decontamination is a critical issue

Launch date: not before March 28, 2023 (Launch readiness)

EC Management

- ECB:
  - **Jason Rhodes** (JPL, US) new ECB chair, starting on Jan 1st, 2022,
  - **Marc Sauvage** new ECB Deputy chair, starting on Jan 2022
  - **Martin Kunz** (U-Geneva CH) new Swiss ECB representative (Jan 1st 2022), replacing Romain Teyssier
- ECL-SO
  - **Francis Bernardeau** (CEA/SPhT, IAP, FR) D-ECL for a second term 2022-2023
  - ECL-SO secretary: selection process expected to close in Jan 2022)

- SWG/IST
  - SCG: **Martin Kunz** leaving SCG, to be replaced in January 2022
  - SWG-TH: **Fabio Fineli** (INAF, U. Bologna, IT), **Alessandra Silvestri**, (U; Leiden, NL), **Valeria Pettorino** (CEA/DAp, FR) new co-chairs/deputy, replacing Luca Amendola and Matteo Viel
  - SWG-MW : **Soeren Larsen** (Radhoud U., NL) new co-chair, replacing Eline Tolstoy
  - IST: BlueGrism: **Margherita Talia** (U. Bologna, IT) and **Claudia Scarlata** (U. Minesota, US) co-chairs
- ECPG-T:
  - Replacement of **Jean-Gabriel Cuby** (current chair, LAM, FR) in January 2022: selection in progress
- SGS
  - **Henri Triou** (CEA, FR) : EC MDB Manager
  - **Samuel Ronayette** (CEA/DAp, FR): EC PLM/SVM Instrument Model Owner
  - **Francisco Castander** temporary OU-SIM lead

End presentation