NISP WE AIV Status

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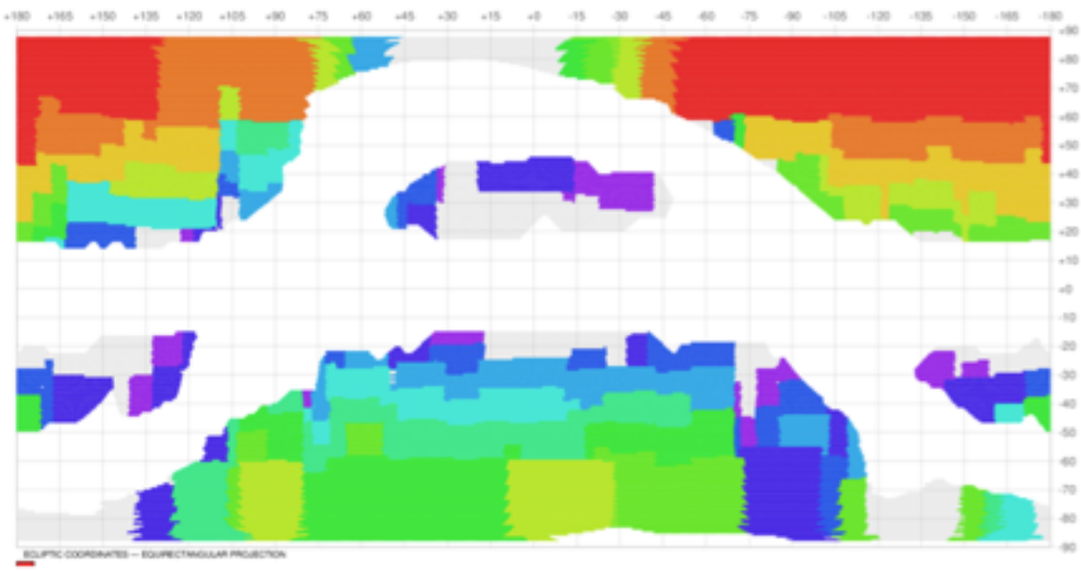
Sommario

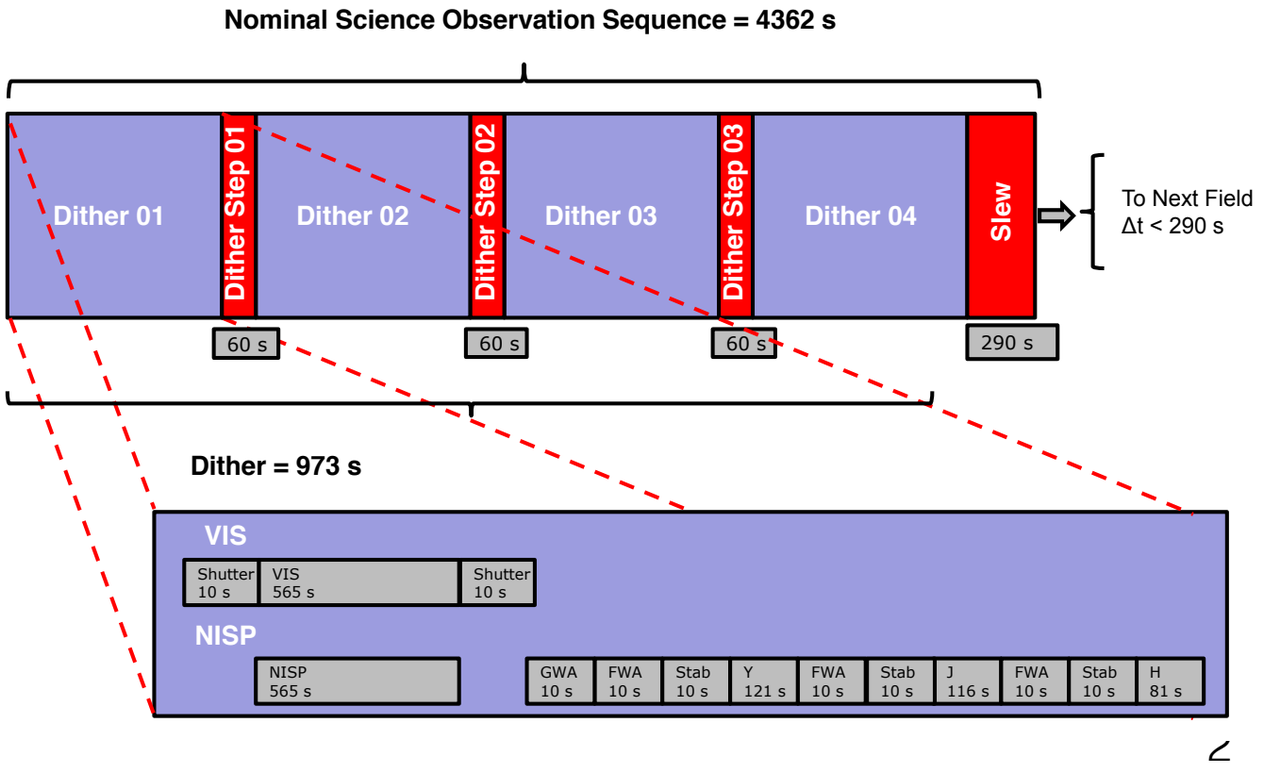
- Stato della Missione Euclid
- Aggiornamento attività AIV WE
- Attività 2017
- Richieste 2017

Status of Euclid mission

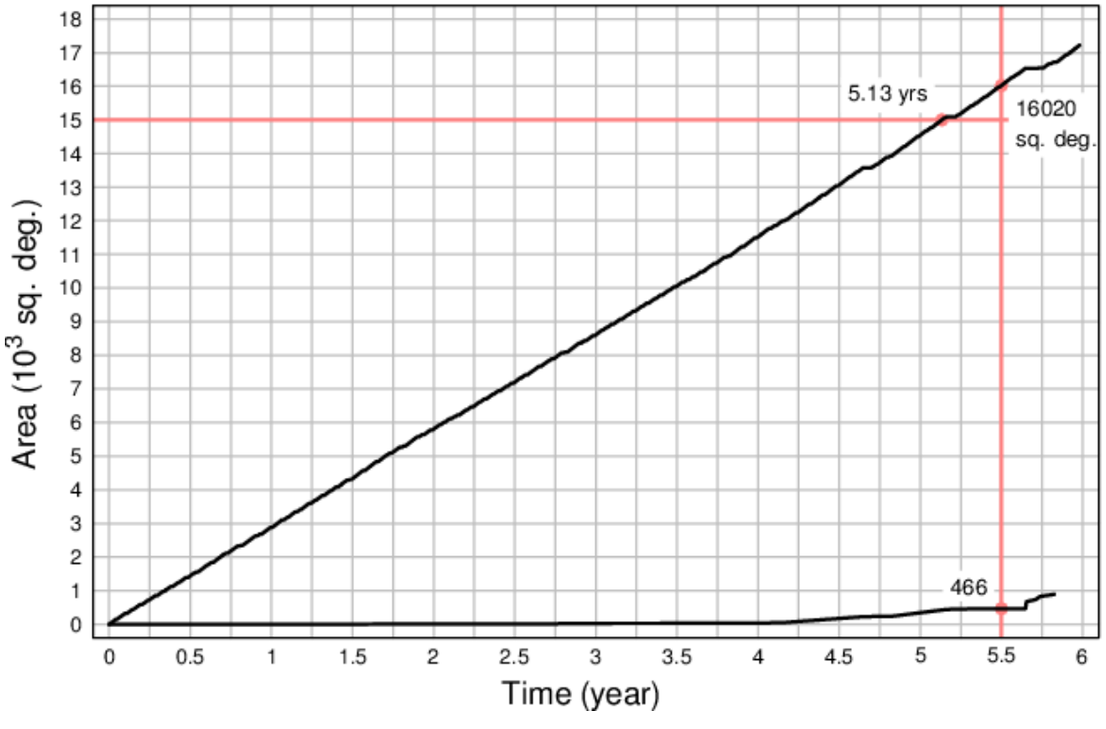
- Mission PDR in October 2015: successful
  - observation of 15000 deg^2 in 5 years
    (four dither of 0.54 deg^2 of common area in 4362 sec)
  - optimisation of the survey in progress
- VIS and NISP instruments CDR in end of September 2016
  - NISP & WE AIV Test Plan document
- NISP Structural and Thermal Model (STM) AIV done
- Sub-system CDRs
  - DPU-HW July : OK
  - ICU-HW July : OK
- DPU & ICU ASW Test Readiness Review in progress

Covered area by the Euclid wild survey

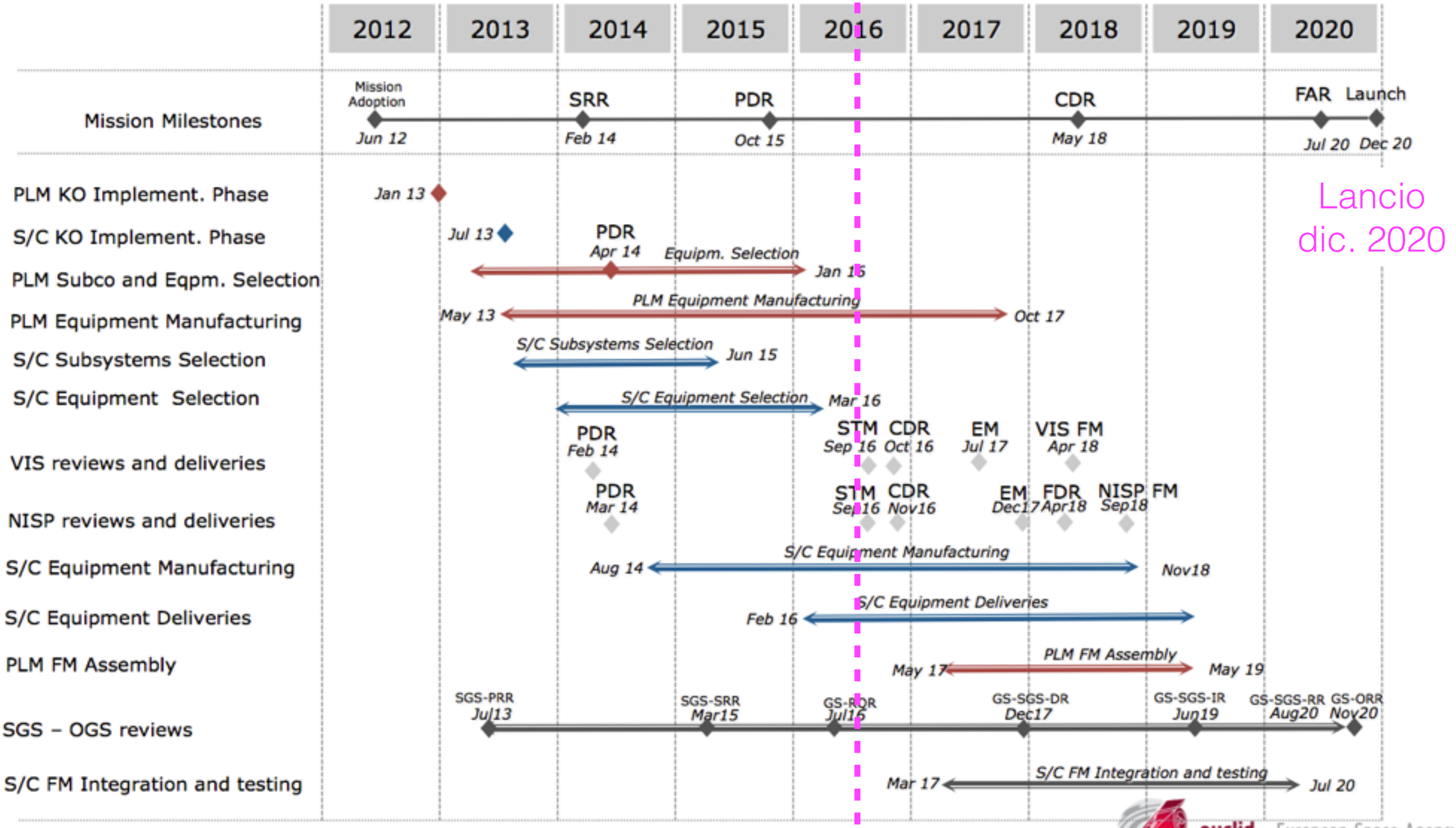




Integrated area for wild and deep survey



Euclid Schedule: Lisbon 2016

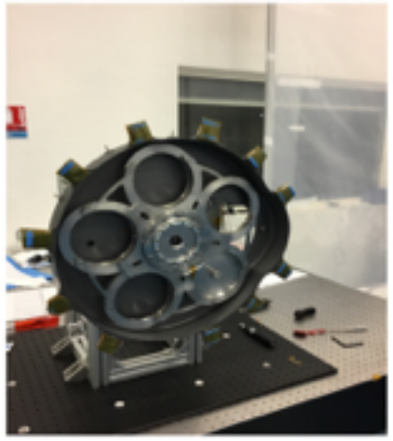


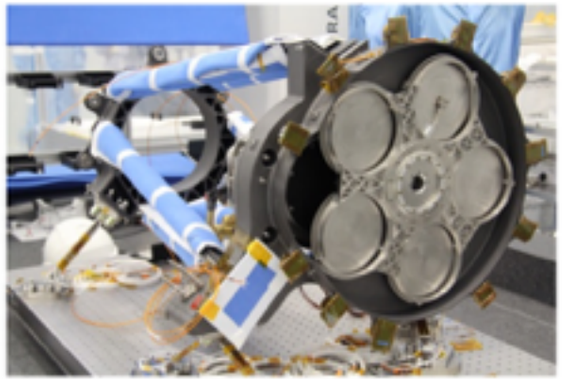
Lancio
dic. 2020

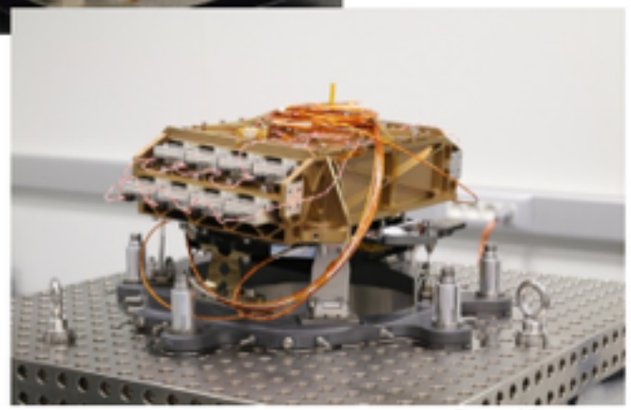
euclid European Space Agency

The NISP STM (structural thermal model)

✓ NISP STM FULLY INTEGRATED AND SUCCESFULLY TESTED IN VIBRATION

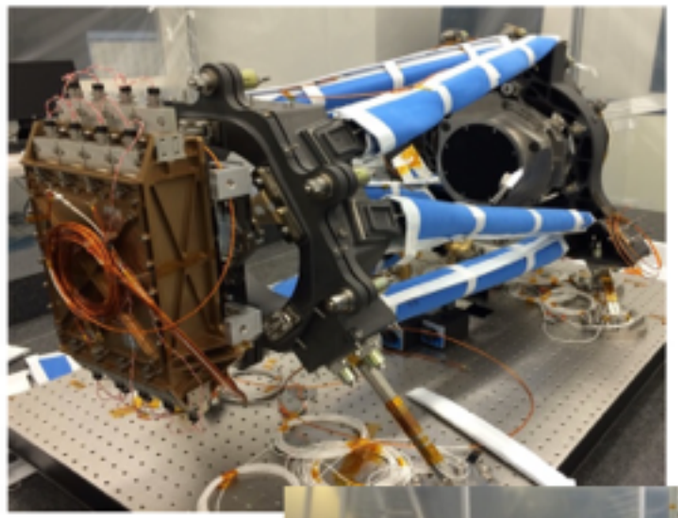


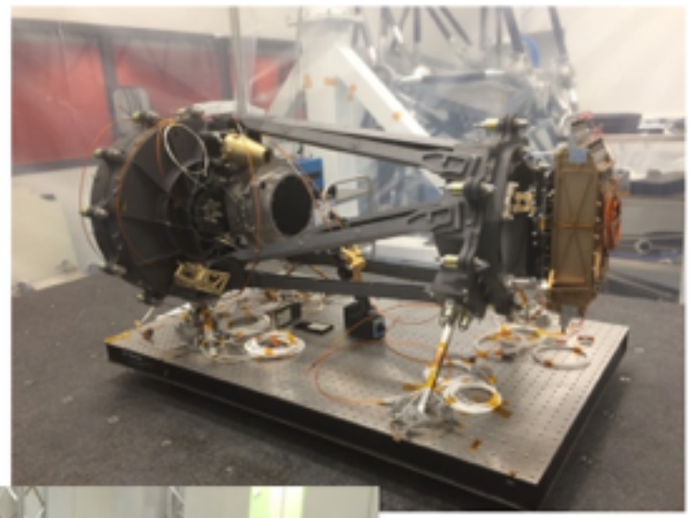


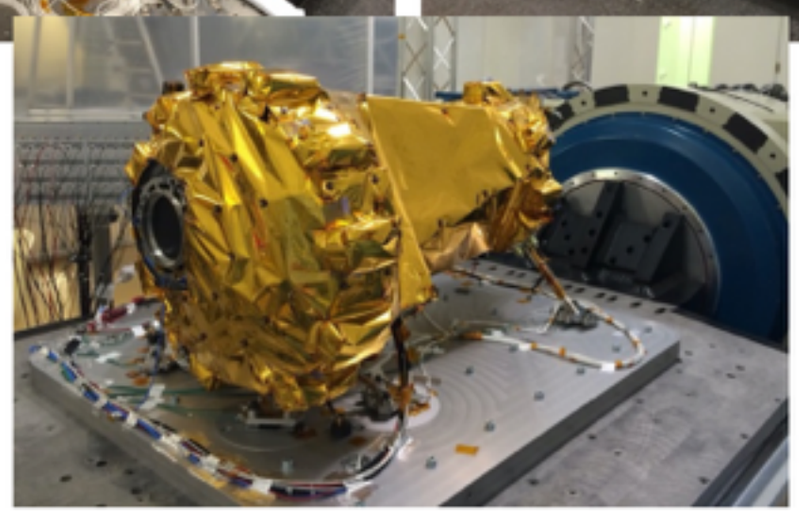


NISP report @ Euclid Meeting (Lisbon, June 2016)

NISP STATUS

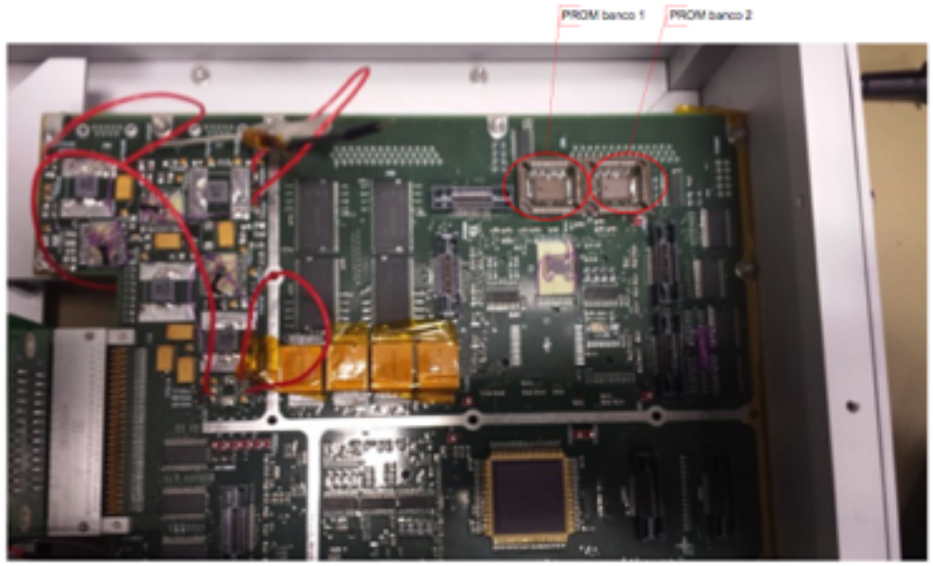






NISP STATUS – Warm electronic (ICU and DPU)

- ICU (NISP control Unit)
  - ✓ ICU CDR expected mid June
  - ✓ ICU Demonstration Model (EBB2 CDPU + setup) realized



- ✓ First version of software to be tested end of June
- ✓ CDR kickoff mid September
- ✓ Coupled ICU / DPU communication test successful

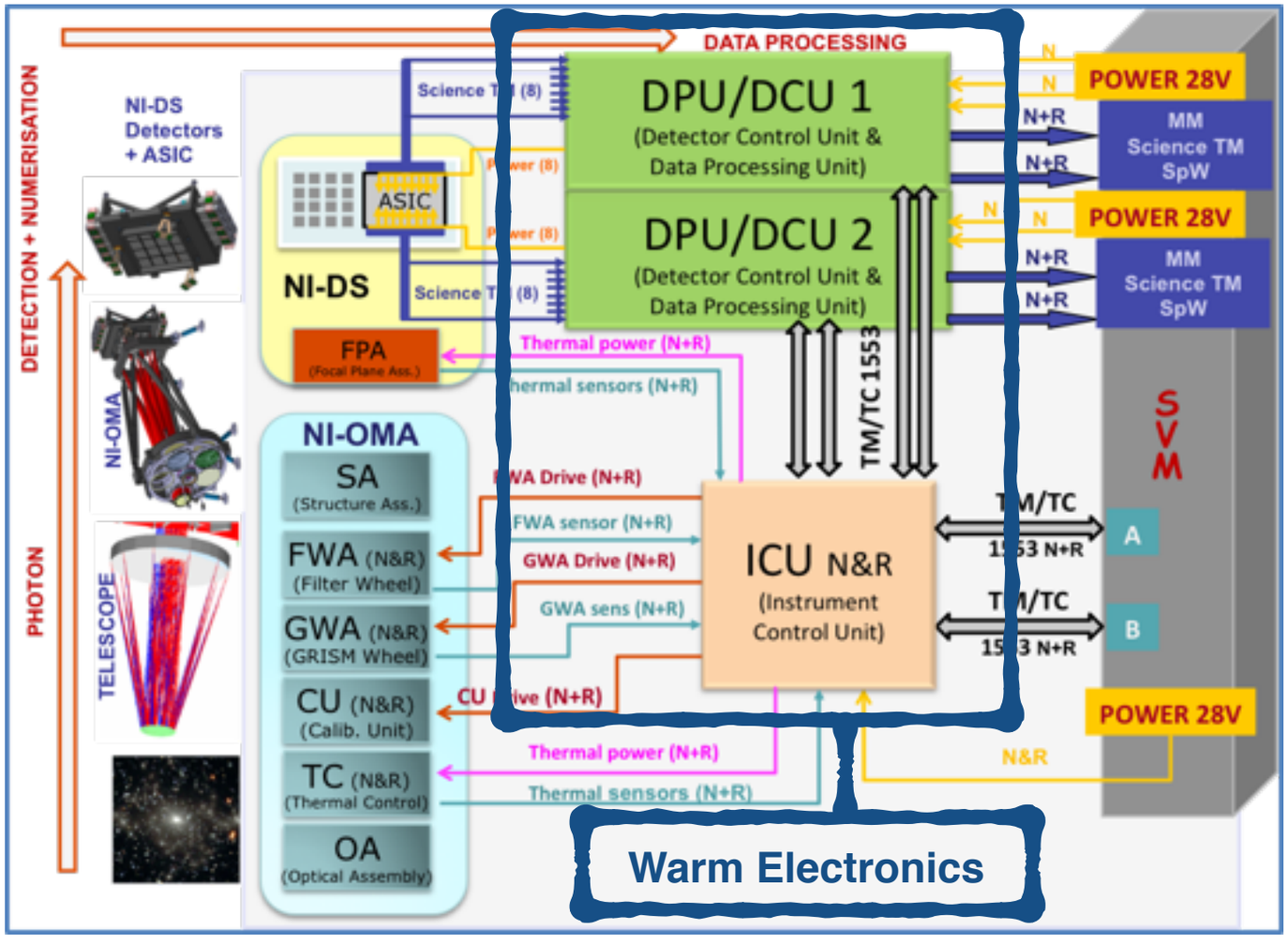
NISP report @ Euclid Meeting (Lisbon, June 2016)

- DPU (Detector control)
  - CDR close out in June
  - DPU demonstrator model test near completion
  - First version version of software to be tested in June.
  - Software CDR for mid September
  - First coupling test with real detector/Flex/Sidecar have been done and are OK

Update of NISP Warm Electronics AIV activity

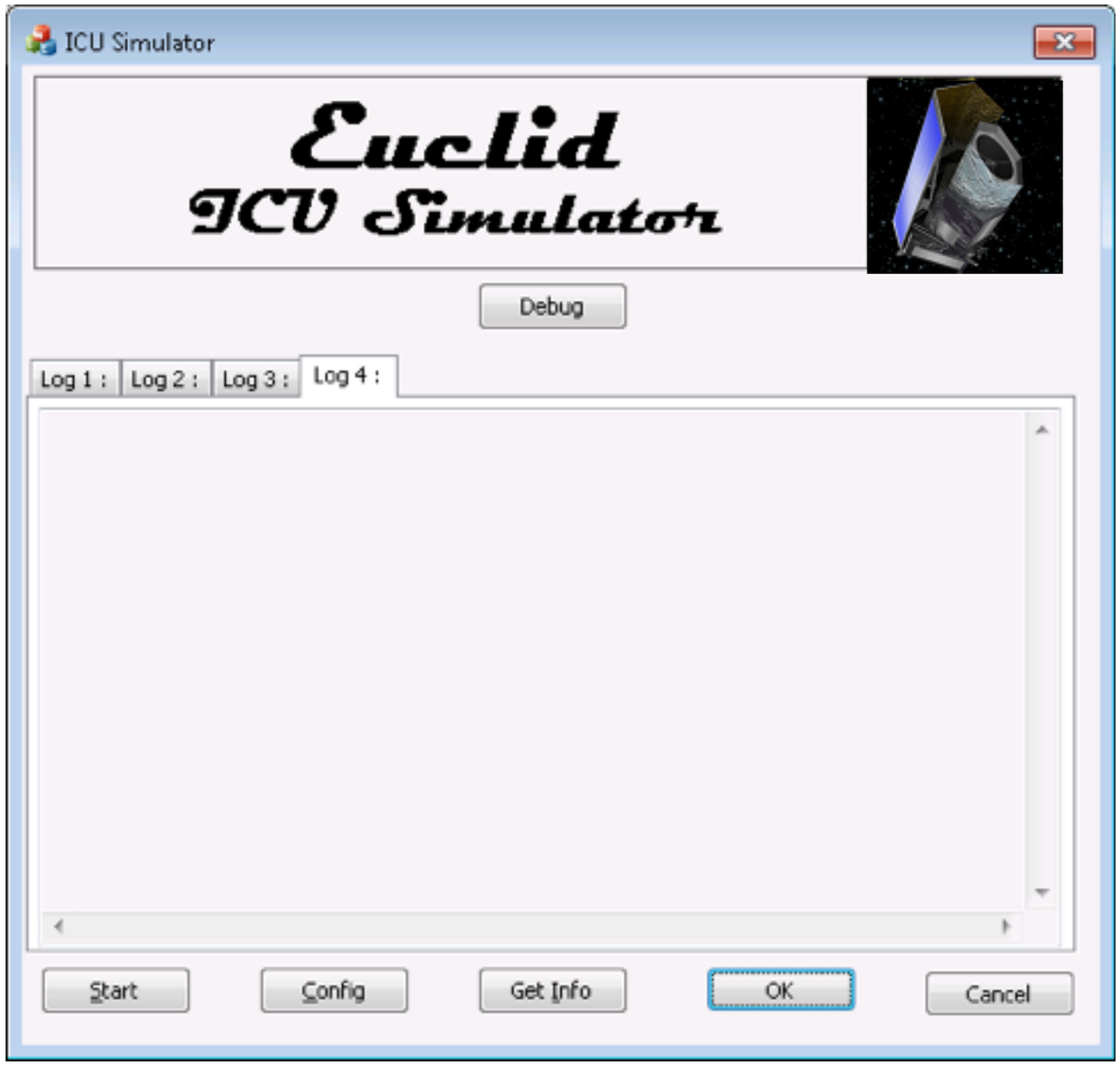
- Aim WE-AIV:
  - ✓ Verify DPU & ICU Application Software (ASW) integrated in the HW (unit level).
  - ✓ Test end-to-end science data and TM/TC path (DPU+ICU).

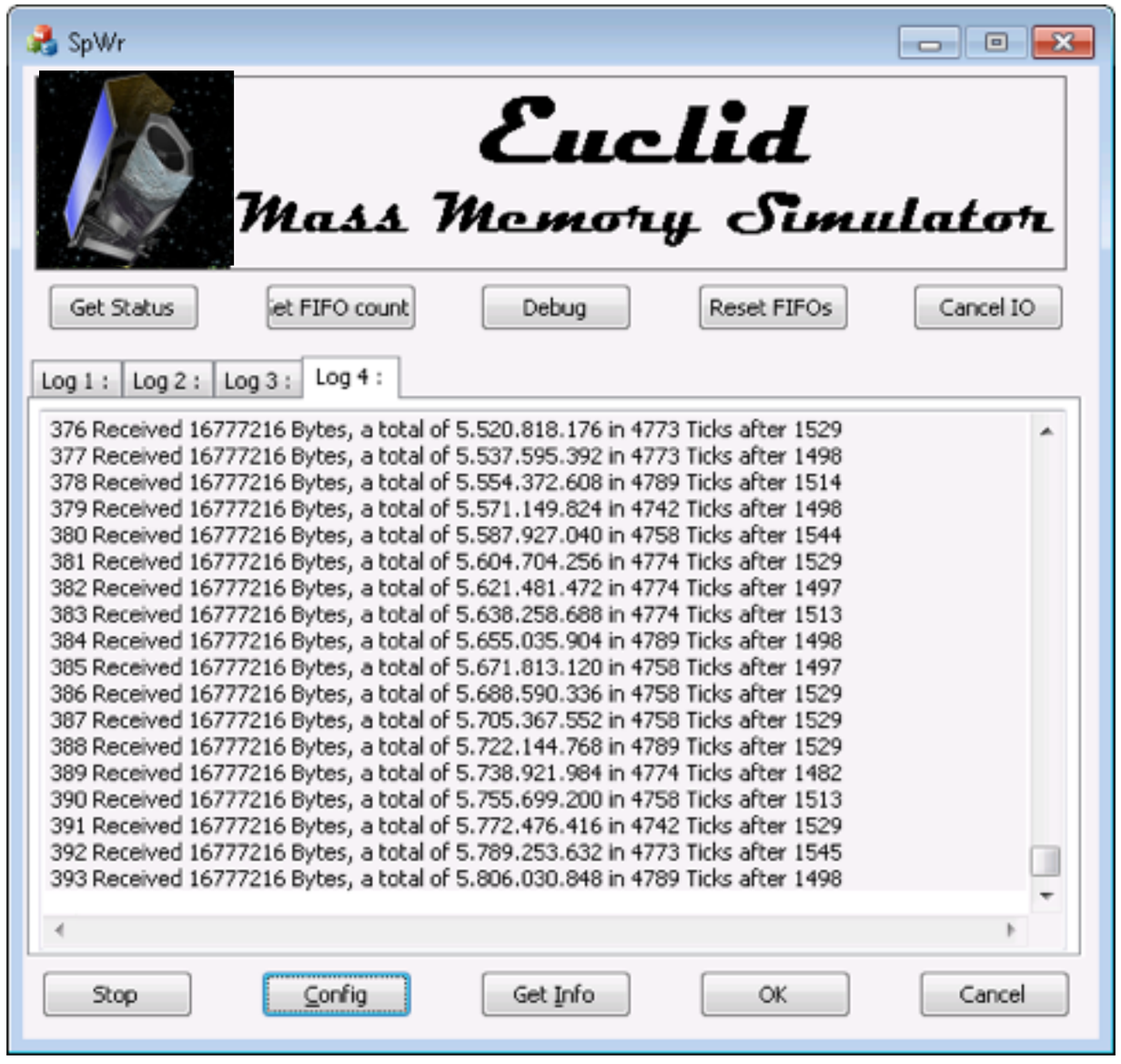
- Development of AIV tools with COTS equipment to be integrate in TE/EGSE: in progress
  - Development of ICU, S/C and DPU simulators —> in progress
  - QuickLook for science data visualisation —> in progress
- Preparation of CCS procedure for WE TC/TM
  - CCS5 Training course @ TERMA (Leiden) followed by 4 INFN person
  - Use of ICU-EBB as test test bench.



- ICU Simulator
- MMU simulator

For DPU AIV and ASW development by OA-Pd





- S/C Simulator

Maggiori dettagli nel talk di G.Sirri

Written in c++ to run on control workstation

Prototipo ICU (EBB)

Euclid Consortium

Maggiori dettagli nel talk di Gabriele Sirri

Test ICU-DPU 1553 communication

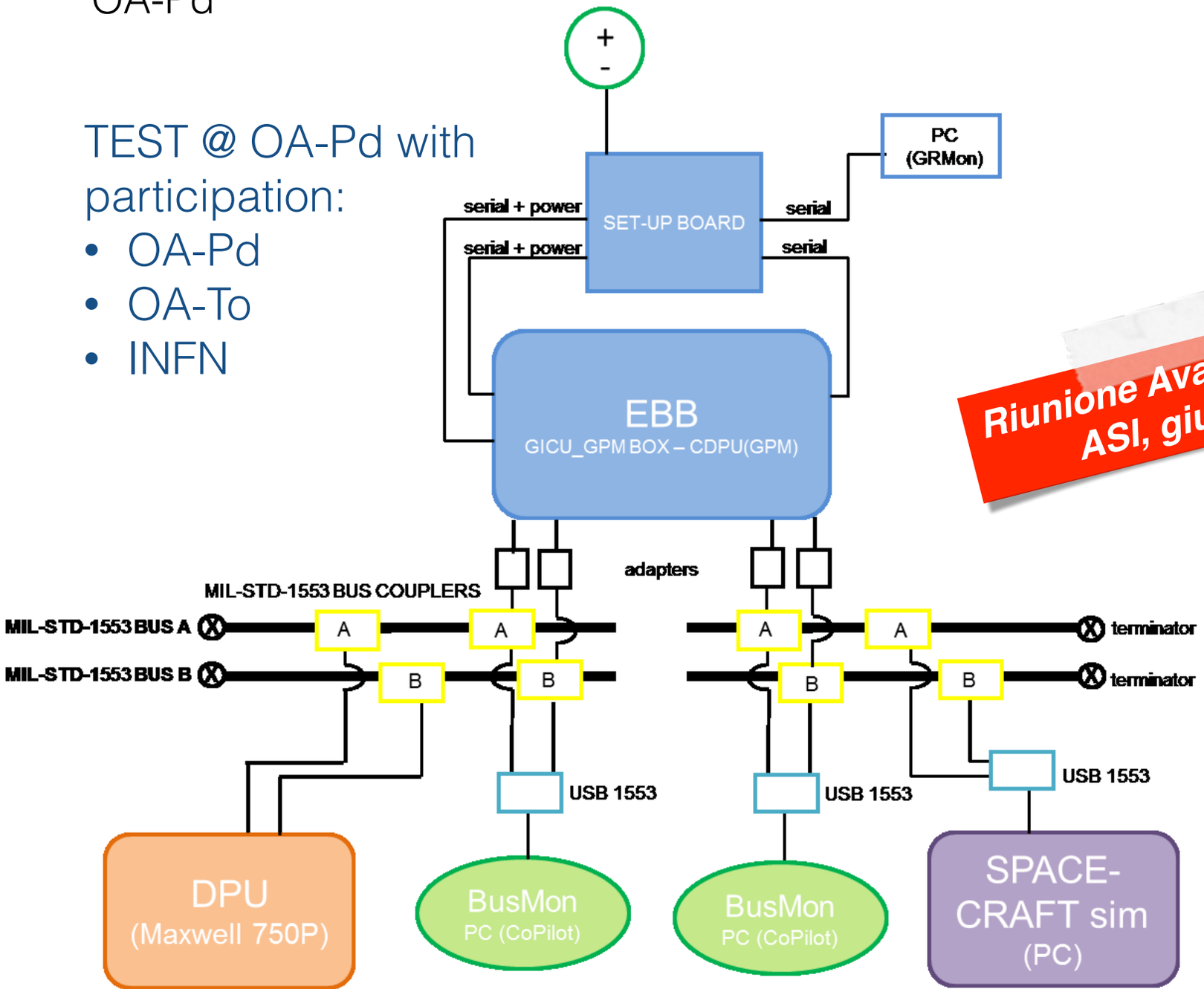
Euclid Consortium

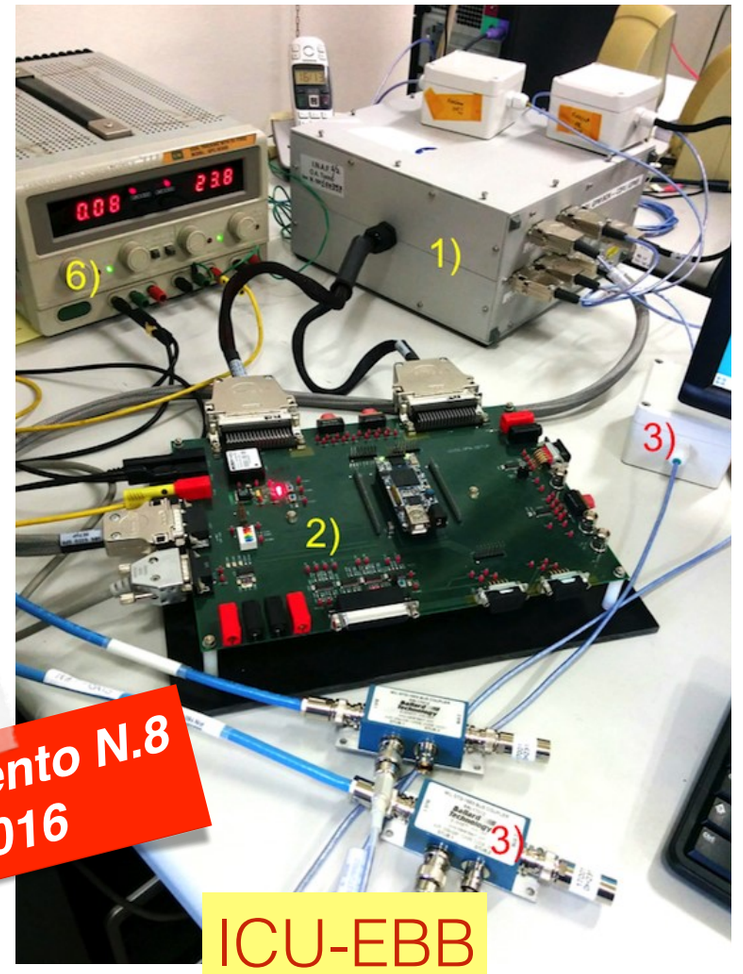
April 5-7 first ICU-DPU communication test (EUCL-OTO-TN-7-006)

- ICU-EBB + prototype ASW by OA-To
- DPU Maxwell SCS750P Board (by CGS) + prototype ASW by OA-Pd

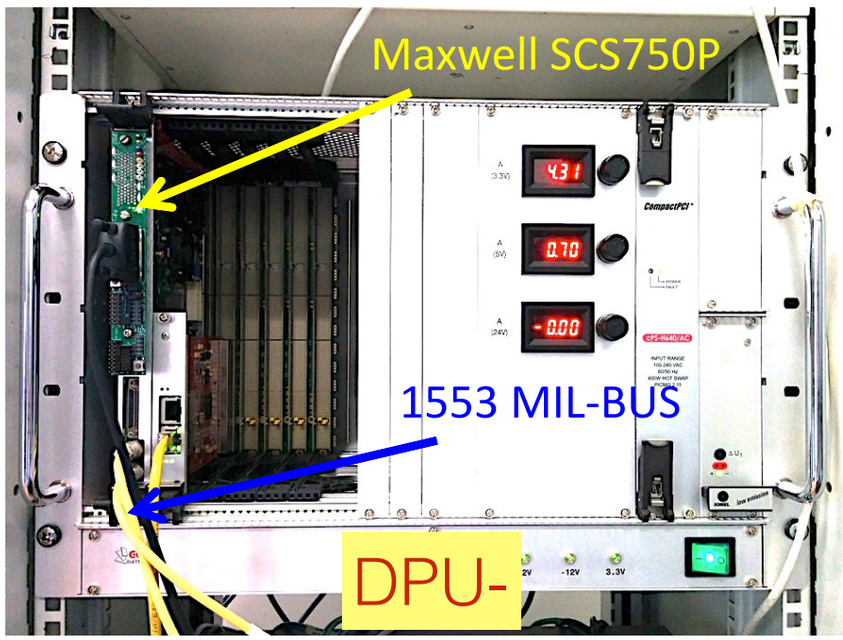
TEST @ OA-Pd with participation:

- OA-Pd
- OA-To
- INFN





Riunione Avanzamento N.8
ASI, giugno 2016



Attività AIV nel 2017

- Integrazione dell'ASW (v1) nei modelli EQM della DPU e della ICU e esecuzioni dei test di qualifica a livello di unita e di elettronica integrata (DPU+ICU = WE) [AIV test]
- Integrazione della WE nel modello EM dello strumento NISP presso LAM a Marsiglia
- Supporto per le procedure TC/TM per i AIV test @ LAM
- Supporto per integrazione e procedure TC/TM per i AIV del modello AVM (Avionic Model) @ Thales Alenia Space (TAS-I), Torino
- Integrazione dell'ASW nei modelli FM della DPU e della ICU e esecuzioni dei test di qualifica a livello di unita e di elettronica integrata (DPU+ICU = WE)

- January - June: AIV test of EQM DPU, ICU and WE (ICU+DPU)
- June - September: AIV test NISP @ LAM
- September - November: AVM test @ TAS-I
- November - December: AIV test of FM DPU, ICU.

Questa attività e "vincolata" da:

- consegna della WE integrata e qualificata al LAM all'inizio di giugno
- ritardo nella consegna del DPU-HW EQM (dic.16 —> aprile 17)
- ritardo nella consegna della ICU-HW EQM (dic. 16 —> giugno 17)
    - ICU-ASW verra qualificato sul modello EM mentre il mode EQM verra consegnato direttamente al LAM dove rifatta l'integrazione e la qualifica del ASW.

—> parte della attività AIV prevista in Italia va rifatta a LAM (Marsiglia) con i modelli EQM

WE AIV report @ NISP Progress Meeting 12 (Marsiglia July 2016)

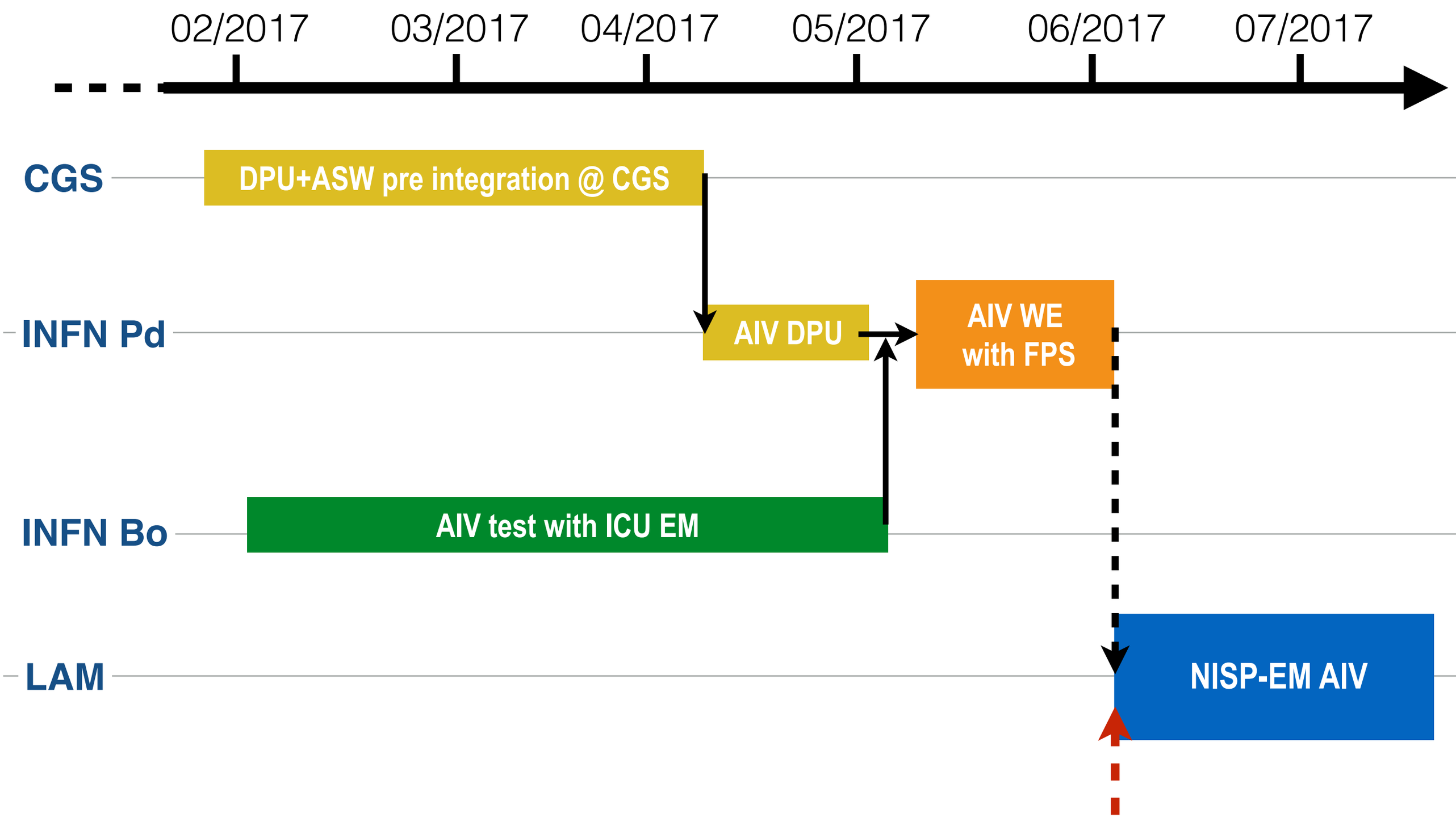
WE-EQM AIV schedule (2017)

- Jan. → April : pre-integration of pre-v1 DPU-ASW in DPU-EQM @ CGS.
- Mid April : delivery of DPU-EQM and ASW v1.
  - 3 weeks for DPU (unit level) AIV with FPS & EGSE (@ INFN-Padova).
- Jan. → April : Integration of ICU-ASW in ICU-EM (@ INFN-Bologna).
- 9 May : 3 weeks for WE (DPU+ICU) ASW integration with FPS+EGSE+SCOE.
- 1 week: DPU back to CGS for CPU swap + short functional test.
- 9 June : delivery of DPU-EQM integrated with ASW to LAM.
- 9 June: delivery of ICU-EQM to LAM.
  - 2-4 weeks for ICU-ASW integration and test @ LAM in air (outside ERIOS) before integration in ERIOS.
- At the end of EM test the DPU has to go back to CGS to prepare the AVM test (CPU swap): 2 wks needed in parallel with ICU EQM AVM refurbishment (no delay wrt. schedule)

- WE-AIV team composition: 4 in Bologna and 4 in Padova

This schedule does still not take into account the delay in the SCOE delivery and the possible non-availibility of the second EGSE. (See the EGSE presentation)

WE EQM AIV Schedule

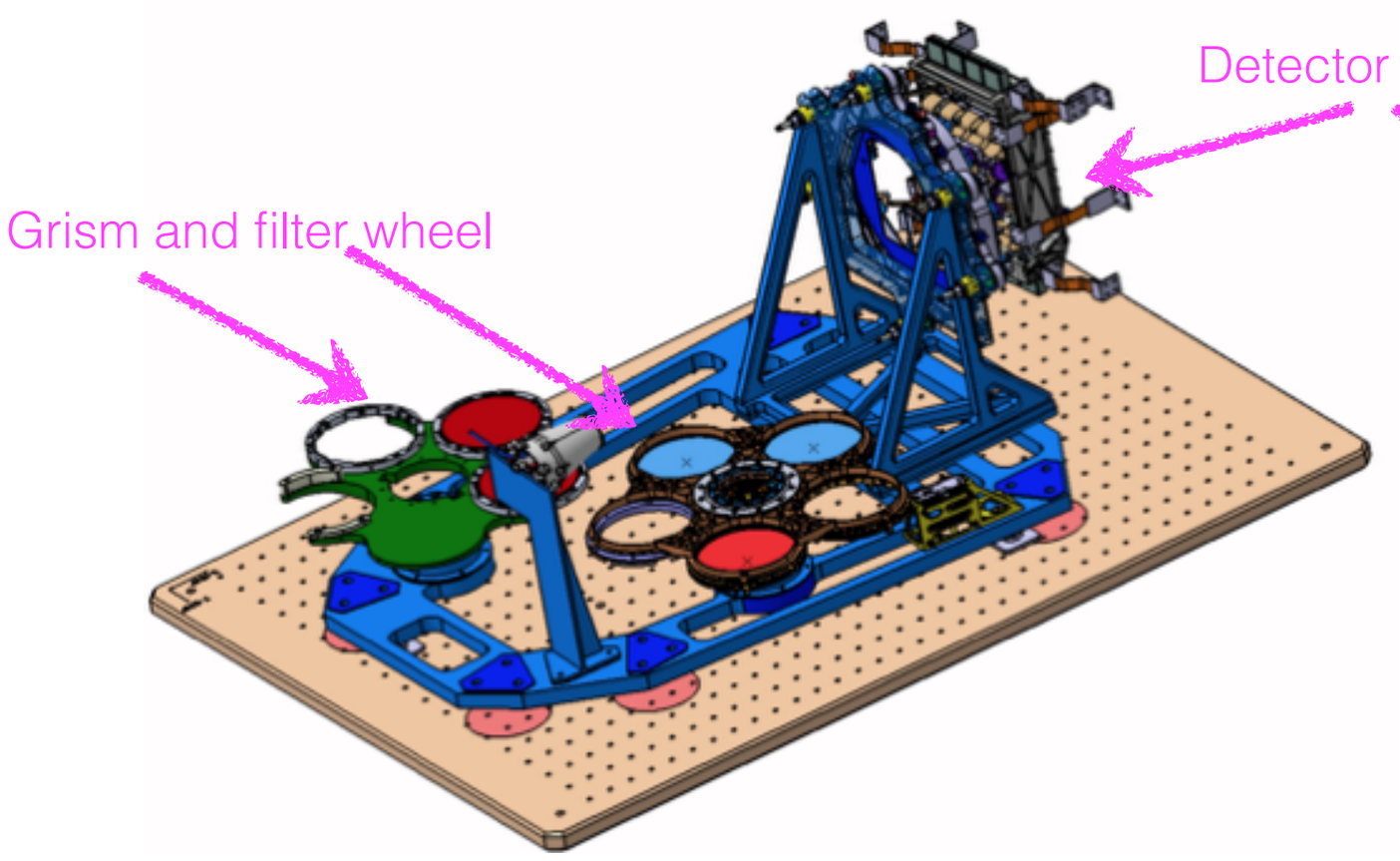


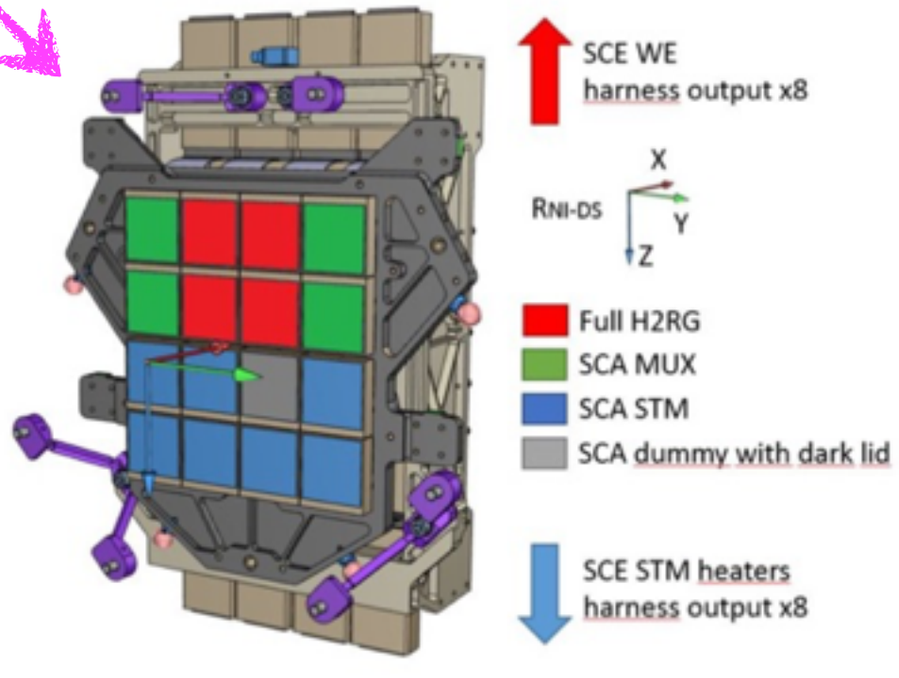
Delivery by CRISA of ICU EQM @ LAM in June 2017

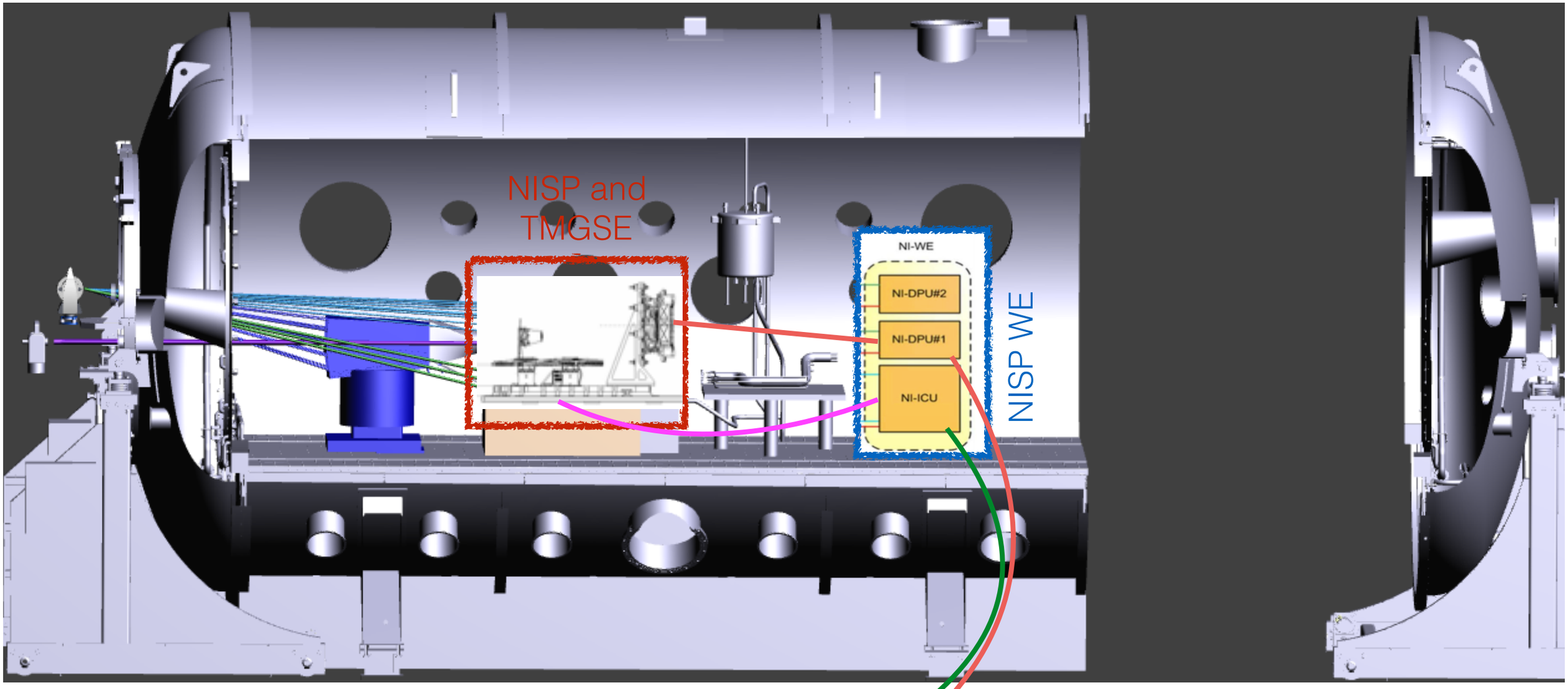
NISP-EM AIV test @ LAM

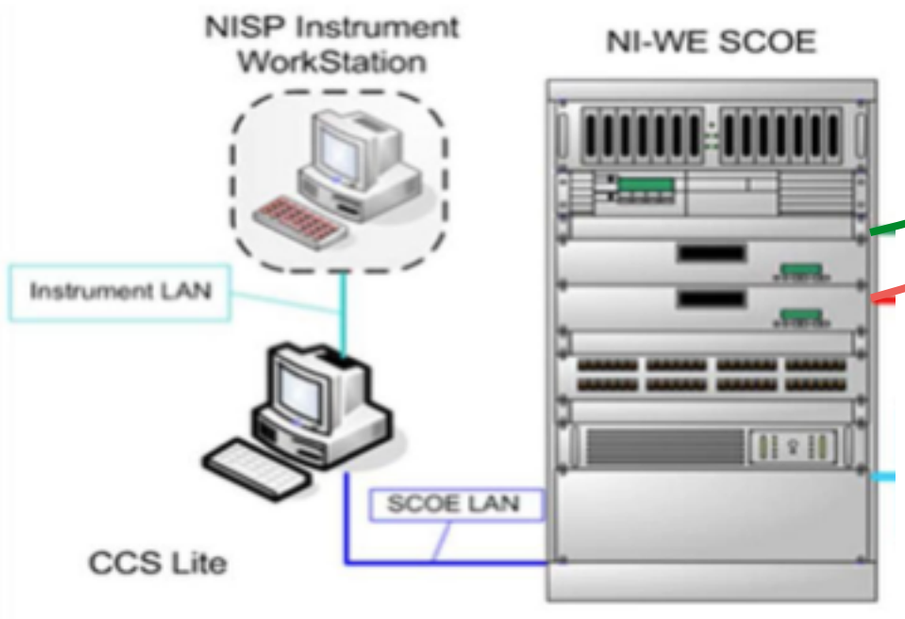
- To prove the electrical and performance function of the Instrument
- To allow unit level electrical, mechanical and thermal qualification of units
- To realise limited EMC test in preparation to the FM EMC tests
- To allow the development of the ground checkout systems
- To validate the, thermal, electrical, command & control test procedures for the FM
- To allow development of calibration procedures
- To allow limited test the NISP performances (limited to dark and flat field to 4 engineering detectors)

45 m^3 cryo-vacuum chamber
77K and 10^{-6} mbar
Large integration room with 100T seismic mass to provide high stability (< 10^{-7}g at 5 - 100 Hz)





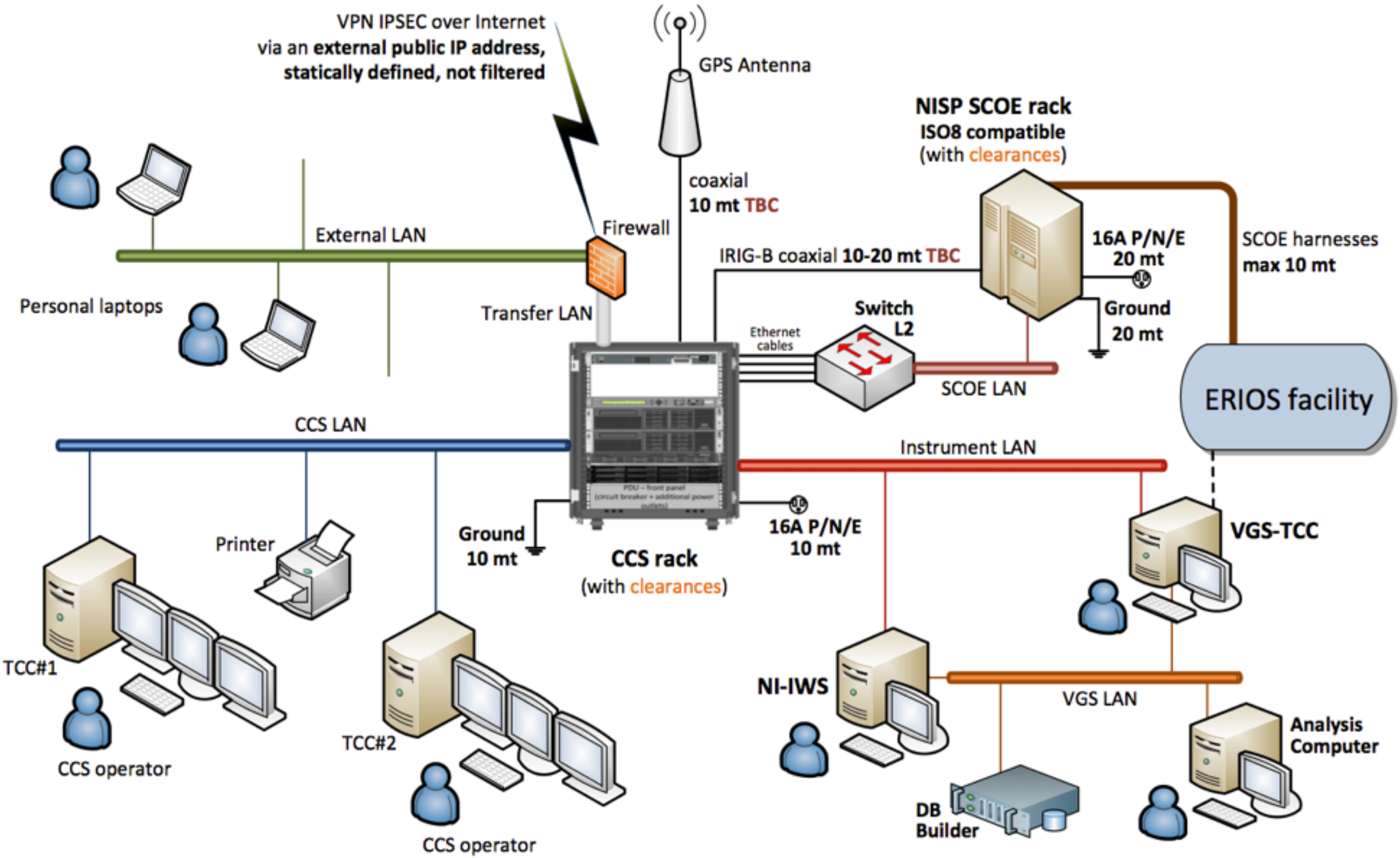




Contributo INFN ai test

- Integrazione WE nel setup
- Supporto per le procedure di TC/TM
- Supporto per procedure CCS (Central Checkout System)
- Turni di Test Operator

EGSE @LAM: a synoptic layout



Missioni strettamente legate attività AIV (Bo+Pd)

- L'attività all'LAM riguarda prima test AIV WE-EQM (~ 4 set.) e poi supporto/turni test NISP-EM (~3 mesi).
  - AIV WE-EQM @ LAM : 4 persone x 4 settimane + responsabile = 20 kE
  - AIV NISP-EM @ LAM : 2 persone x 12 settimane + responsabile = 24 kE + 4 kE

- Supporto AVM test @ Thales Alenia Space (To) : 1 persona 2 setimane = 2 kE

- Attivita di pre-integrazione DPU ASW @ CGS Milano = 4 kE

- Supervisione ai test di accettazione del HW DPU e ICU presso CGS e CRISA per EQM e FM
  - 4 riunioni (3 gg) per 1/2 pax = 4 kE

- NISP Progress Meeting (PM) con ESA 3/4 riunioni (2 gg) x 2 persone (Pd+Bo) = 6 kE
- Riunioni di Avanzamento (RA) contratto ASI 3/4 riunioni (1g) x 1 persona = 1kE

- Riunioni brevi : 2 kE

Richieste specifiche Padova

Consumo:
Camera pulita + metabolismo = 2.5 kE
Cavi MIL-BUS & SpaceWire = 3 kE
Manutenzione UPS = 1 kE
Licenze annuale VxWorks = 12 kE

Inventario:
SpeceWire monitor board = 7 kE
Logic State analyser portatile (PC board) = 1 kE
Notebook per test LAM = 1 kE

Pubblicazioni tecniche in collaborazione

Proceedings della conferenza SPIE Space Telescopes and Instrumentation 2016.

1. “Euclid Near Infrared Spectrometer and Photometer instrument concept and first test results obtained for different breadboards models at the end of phase C”
2. “On-board data processing for the near infrared spectrograph and photometer instrument (NISP) of the EUCLID mission” *
3. “EGSE customization for the Euclid NISP Instrument AIV/AIT activities”
4. “Detailed design and first tests of the application software for the instrument control unit of Euclid-NISP”
5. “Instrument Workstation for the EGSE of the Near Infrared Spectro-Photometer instrument (NISP) of the EUCLID mission”

* Poster presentato da F.Laudisio, INFN Padova, CISAS e Universita di Padova