

AIT and V “The Plan”

AIV SW MEETING – 19/20 Feb 2024 Brera (Mi)

Giuseppe Leto WP1500 SST-WT7 AIT/V

AIT/AIV “The Plan”: Team

SST working team		Coordinator	Team
WT7	WP1500 AIT/V Team	G. Leto	<p>Management support: Julien Cailleaux, Valentina Giordano, Ricardo Zanmar Sanchez Castelan, New INAF TD (2024/25 ...)</p> <p>Mech. Structure: Carmelo Gargano</p> <p>Optics: Giorgia Sironi, Laura Proserpio</p> <p>Cherenkov Camera: Richard White</p> <p>AIT/V Software: Gino Tosti, Simone Iovenitti, Pietro Bruno, Stefano Germani, Ricardo Zanmar Sanchez Castelan</p>

AIT/AIV “The Plan”: activities



AIT/AIV “The Plan”:

Before site activities

AIT/AIV “The Plan”: Before site activities

AIV Plan

SST-PRO-PLA-013, Ver 1, issued on 22/11/2022

Based on ASTRI-Horn and ASTRI MA T1 experience ... but:

- New provider company
- Improved Structure
- Different site/work conditions/constrains
- Improved AIV Software

AIV Plan needs to be revised continuously during Design ...



SST Programme: Verification Plan

SST-PRO-PLA-013

Version 1a

Prepared by:		
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Latest Release Checked by:		
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Nicola La Palombara (INAF)	<i>Nicola La Palombara</i>	SST-PRO QM
Alberto Macchi (INAF)	<i>Alberto Macchi</i>	SST-PRO CADM
Approved by:		
Giuseppe Tagliaferri	<i>Giuseppe Tagliaferri</i>	SST-ESC

AIT/AIV “The Plan”: Before site activities

AIV Verification Control Document (VCD)

- SST-PRO-PLA-013 addendum, Ver 0, 22/11/2022
Preliminary version, just a draft (VeControlDocDesandUse)
- The spreadsheet must be prepared

AIT/AIV “The Plan”: Before site activities

Procedures and Test Plans

To be acquired/developed based on company/provider accepted documents

- Safety Procedure for M1 segments mount/dismount, ladder against cherry picker truck (ASTRI-Horn updated)

.....

AIT/AIV “The Plan”: Before ... Additional work with ALL teams

Infrastructures to be identified or set before site activities start

working areas/machines

- Warehouse and/or Assembly area?
- Office Space, Test Stands, and Test Area (Tel. Site Area)
- Vehicle Fleet (Cherry Picker/Cherry Picker Truck, Pick-up/Truck or Truck equipped with lifting device)

hard/soft equipments

- Software for Integration and Test
- Communications Infrastructure (radio, wifi)
- Equipment Inventory
- Equipment tracking (where is what)

Update AIV PLAN consequently

AIT/AIV “The Plan”: BefSitAct ... Site working team Plan

Assembly/Integration phase: working teams

Site activities will involve:

- Italian company team
- French company team

A plan must be prepared to avoid interferences among teams at work on site,

We must take into account:

- tools and resources to be shared
- team composition, ESO will assign us resources ... must avoid overcome

In addition

- SST Teams for AIV, Mech, Elec, Opt, ... will in turn be there

A coordinated shift schema/schedule to avoid interferences is mandatory

AIT/AIV “The Plan”:

Site activities

AIT/AIV “The Plan”: At the site

During Assembly/Integration

1. Try to stay on schedule
2. Perform/follow planned Tests
3. Produce Test Reports - Demonstrate the full accomplishment of objectives ... hopefully

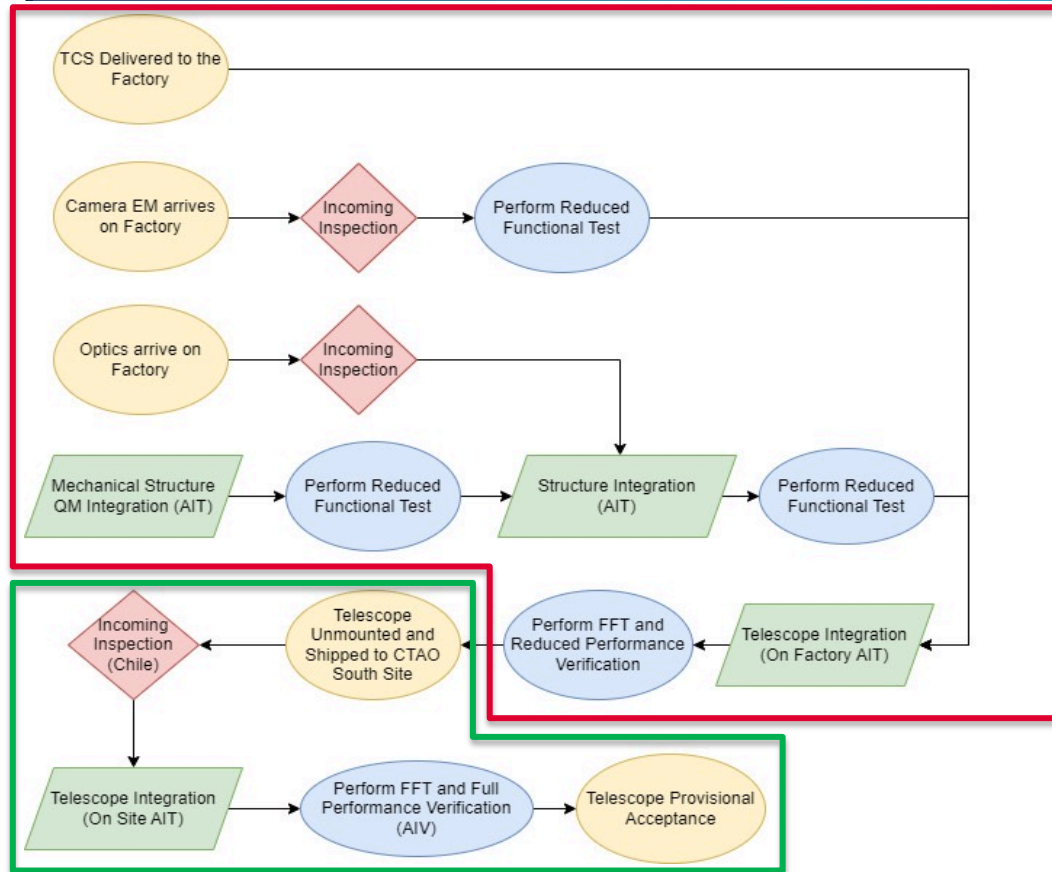


Simple!

AIT/AIV “The Plan”: First AIT/V for real!!

First real step will be “in Factory”

AIT/AIV “The Plan”: Factory/site AIT/V & acceptance of SST-TEL#1-1* and SST-TEL#2-1 (if needed?）**



- AIT in Europe (factory)
.. may be some limited on sky test !!
- AIT/V in Chile – onsite

TCS AIV Soft plays primary role

*Tel#1-1 T1 of the first tender

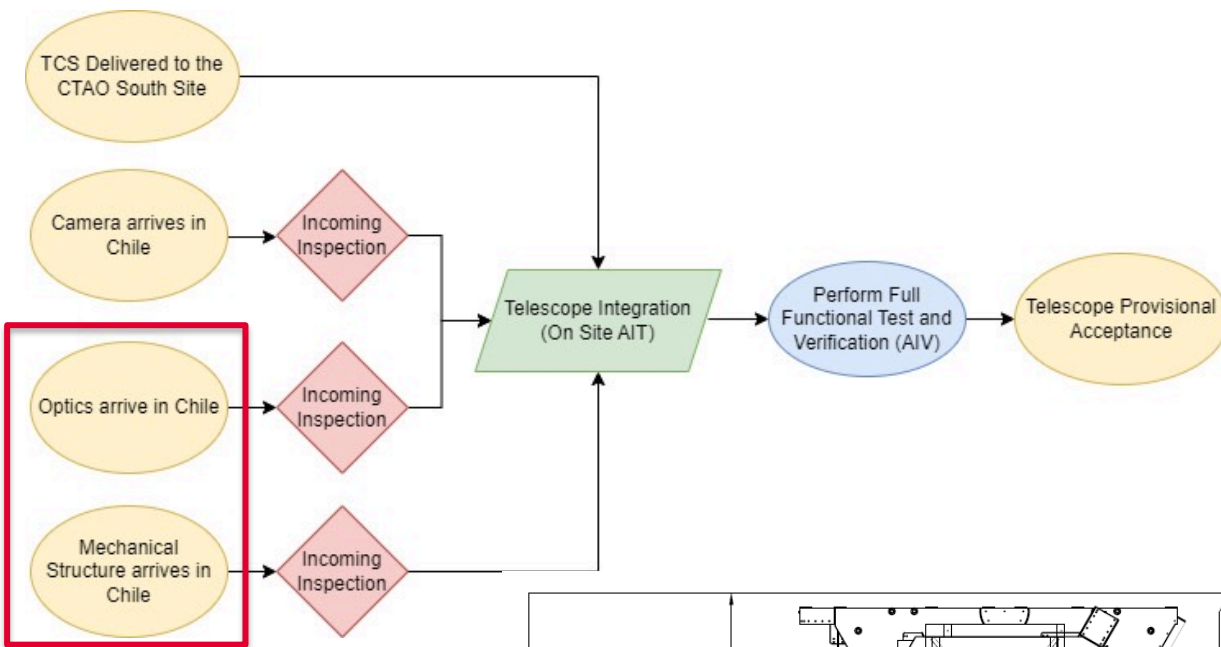
** Same will be done for other tender in case the provider company changes

AIT/AIV “The Plan”: First AIT/V for real!!

**During/After
Factory/site AIT/V & acceptance of SST-TEL#1-1**

AIT/V Plan will be verified and perfectionated

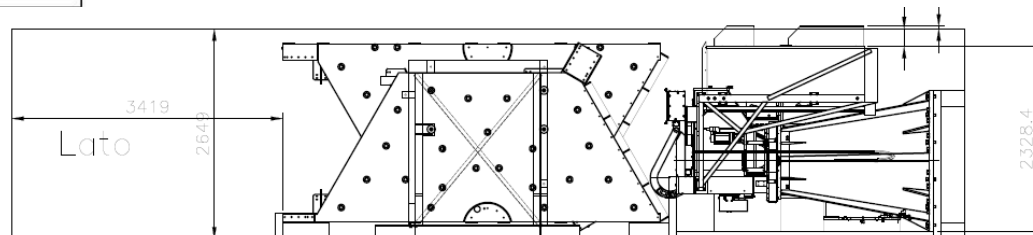
AIT/AIV “The Plan”: On site AIT/V & acceptance of SST-TELS



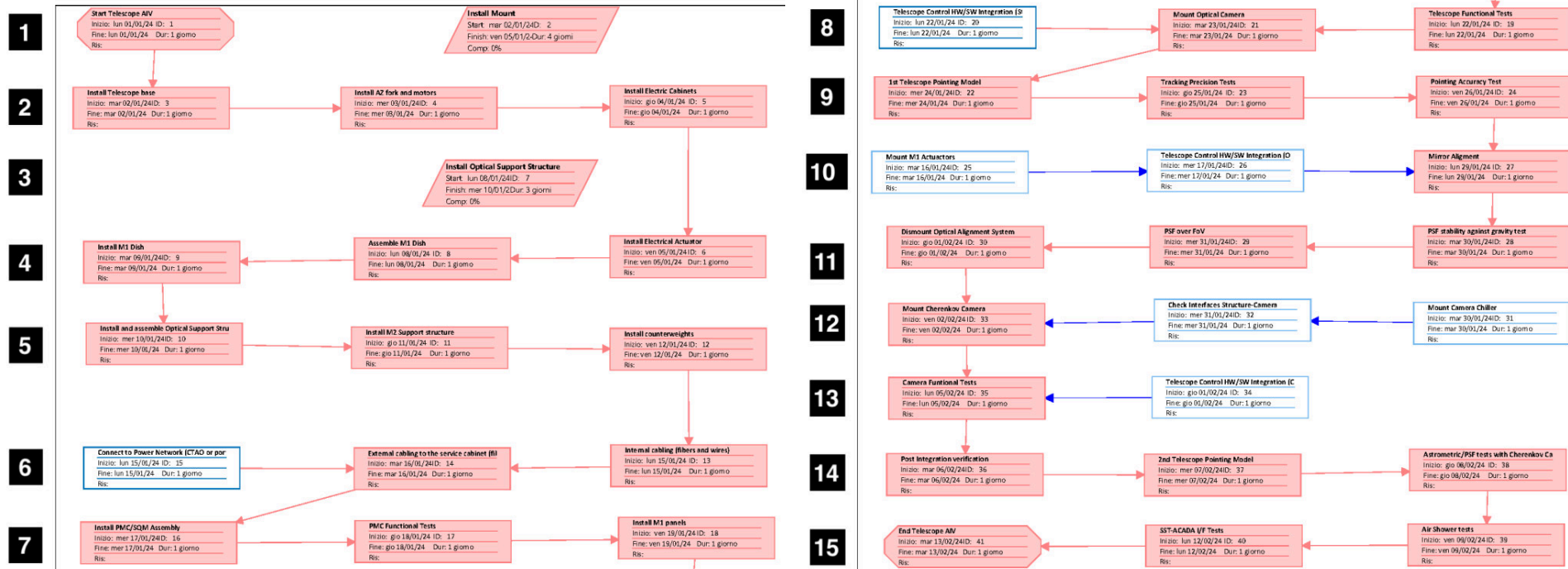
SST-TEL# provisional acceptance

- Inspections
- Integration
- Full functional test and VCDs and NCR/RFDW in the case, not probable, not wanted, not ... not ... of need

TCS AIV Soft plays primary role



AIT/AIV “The Plan”: On site AIT/V sequence V1.a



Changes must be already be applied, other will come (Es. Pre-cabled cabinets etc ...)

AIT/AIV "The Plan": TIME LAPSE

The prototype ASTRI-Horn Assembly/Integration/Verification



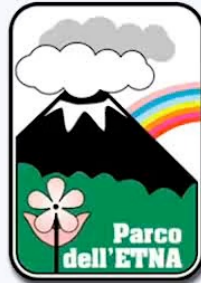
INAF



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Presidenza Italiana
del Consiglio
dell'Unione Europea



Credits

• Eugenio Martinetti

AIT/AIV “The Plan”: AZ assembly mounting & grouting

STEP 1,2,3

ASTRI-1

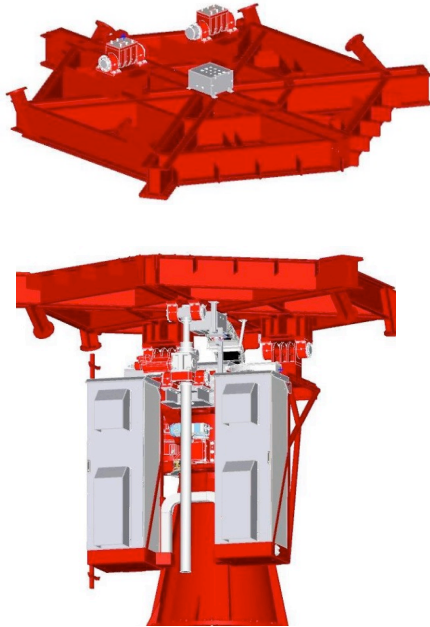


Grouting

→ 60 liters of water
→ 3-4 days to dry

AIT/AIV “The Plan”: M1 dish assembly & integration

STEP 4



ASTRI-1



AIT/AIV “The Plan”: M2 optical support structure integration

STEP 5

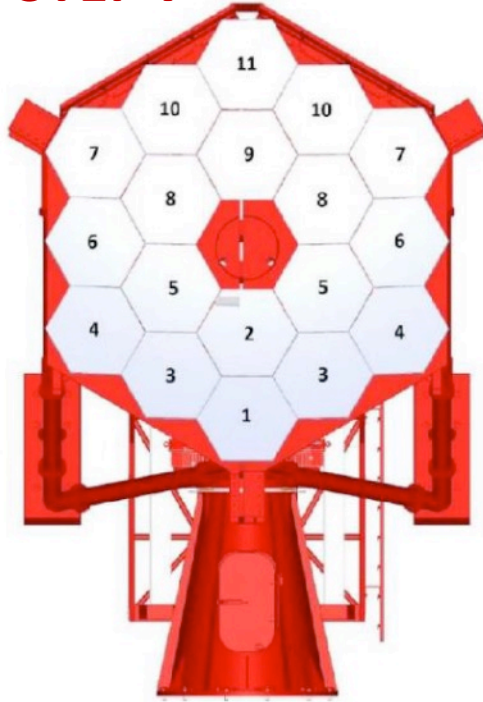


ASTRI-1



AIT/AIV “The Plan”: primary mirrors integration

STEP 7

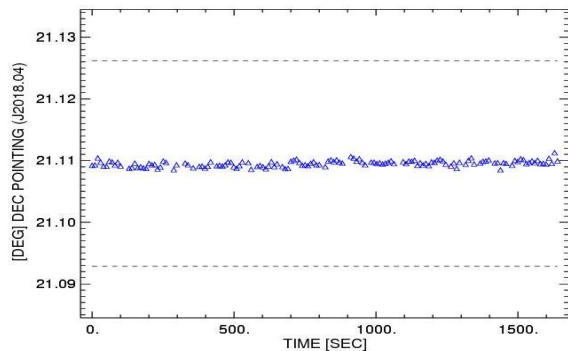
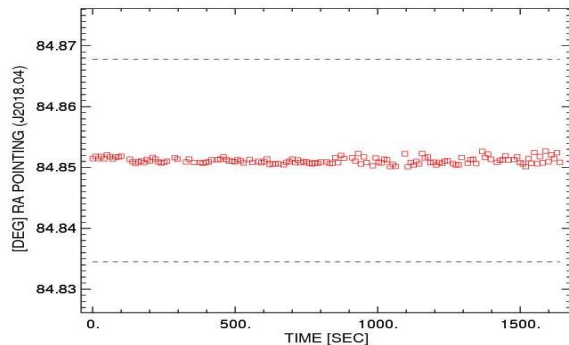


ASTRI-1



AIT/AIV “The Plan”: mechanical structure verification

Tracking performance

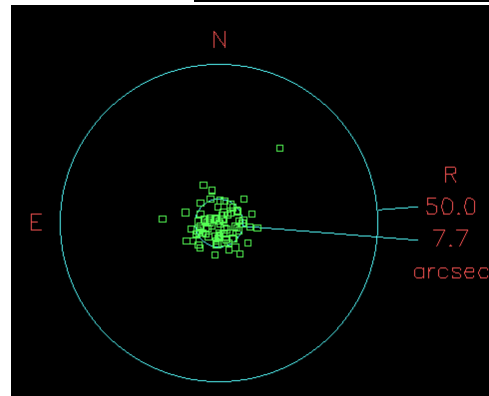
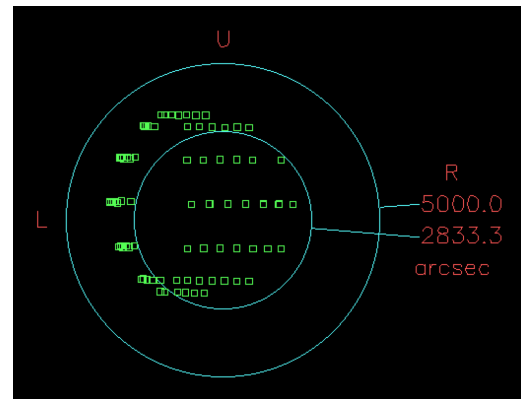


Pointing monitoring camera

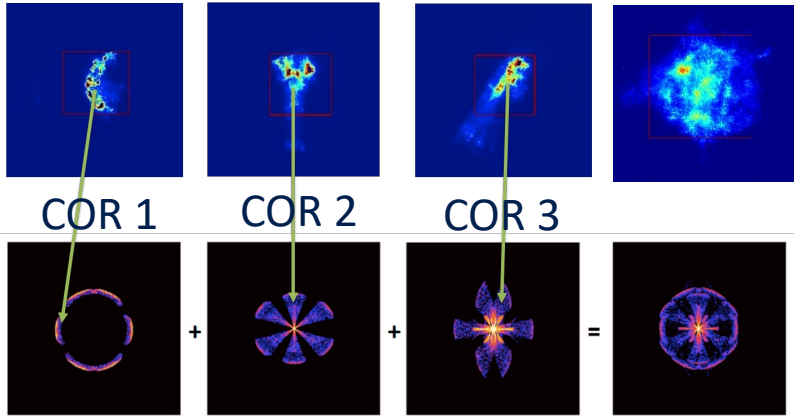
STEP 9



Pointing model

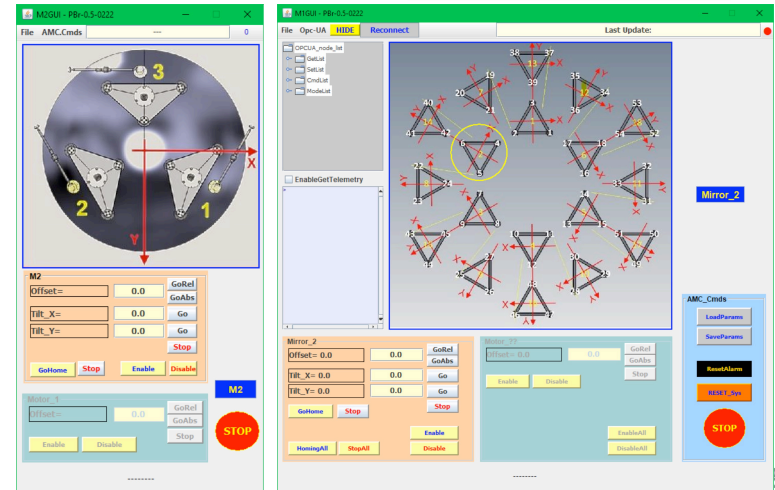
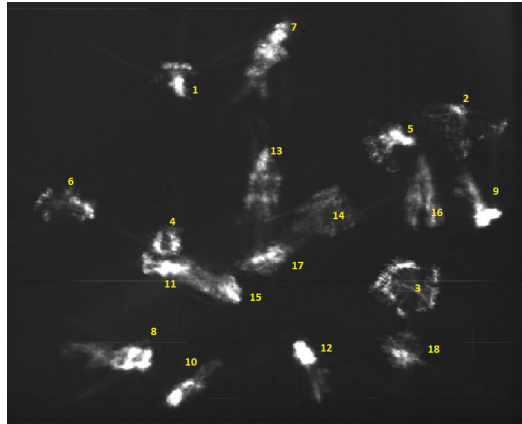
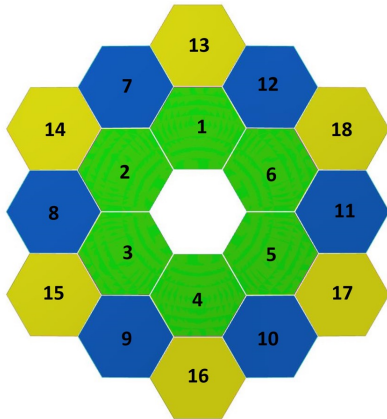
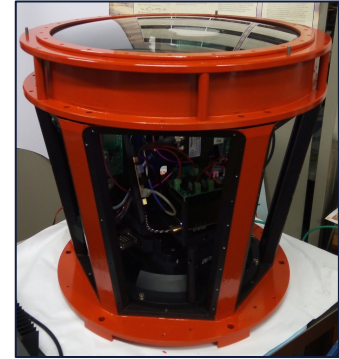


AIT/AIV “The Plan”: optics verification



STEP 10,11

Mirrors alignment



AIT/AIV “The Plan”: Camera integration

STEP 12,13

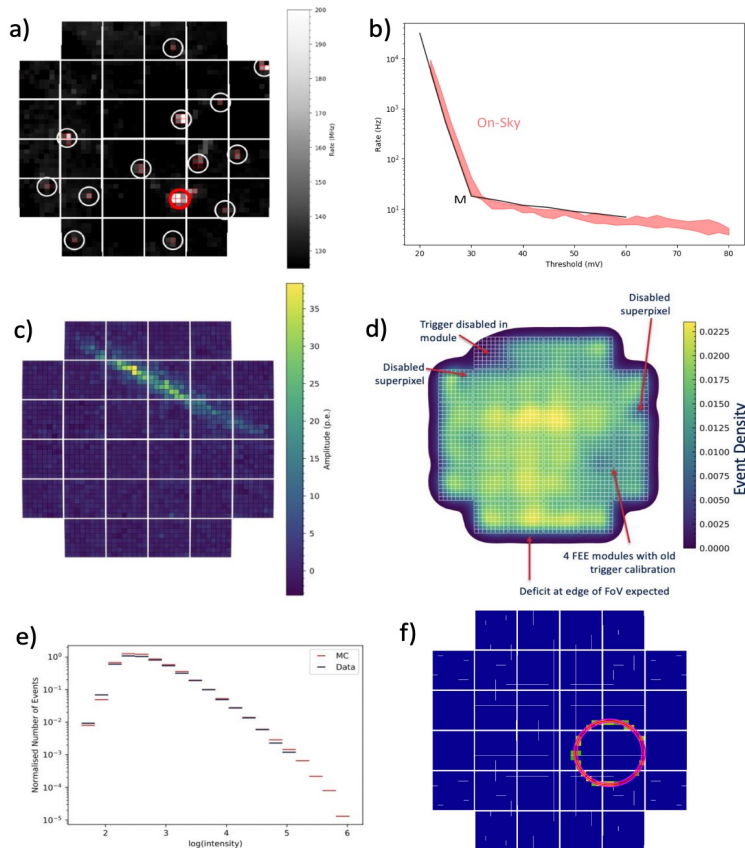
Cherenkov Camera functionality checks

- Power switch on.
- Lid open/close test using Local Mode.
- Cooling liquid flow test.
- Confirmation of correct power consumption, current flow.
- Confirmation of network and clock connectivity.
- Confirmation of expected internal Camera Unit humidity level.
- Cycling of camera states
- R1 data and trigger timestamps
- Noise levels in the camera with photosensors (moonless night)
- Camera calibration flasher is activated to provide a periodic trigger of the system (moonless night)

No telescope motion needed



AIT/AIV “The Plan”: functional verification



STEP 14,15

- Functional verification (AIV software/ACADA)
- Astrometric/PSF verification with stars
- Air-shower measurements
 - Air-shower trigger verification
 - Air Shower parameter distributions
 - Muon rings
 - Stability/Calibration system performance

AIT and V “The Plan B”

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AIT/AIV “The Plan”: “PLAN B”



AIT/V team

AIT/AIV “The Plan”:

