



cherenkov
telescope
array

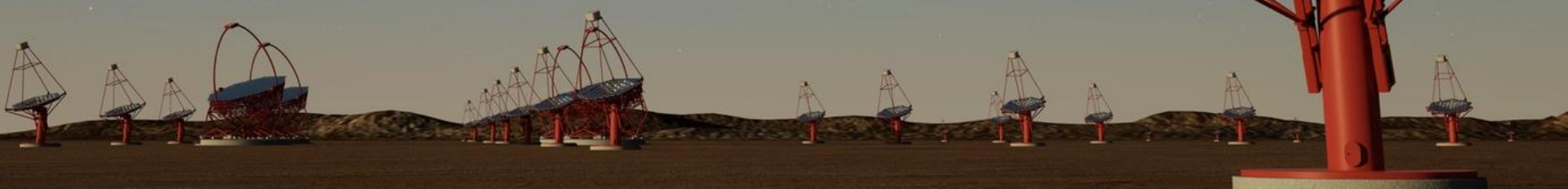


AIV general status

NectarCAM F2F

LP2I, Bordeaux, 10-12 October 2022

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B. Vallage, P. Venault,, E. Virique IRFU





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Thermal tests

List of the thermal tests

- Test 35°C B-ENV-0220 Survival Temperature
- Test 30°C B-ENV-0225 Survival Temperature Without Power
- Test 25°C B-ENV-0210 Observation Temperature to
Test -5°C B-ENV-0210 Observation Temperature
- Test -10°C B-ENV-0225 Survival Temperature Without Power
- Test -15°C B-ENV-0220 Survival Temperature

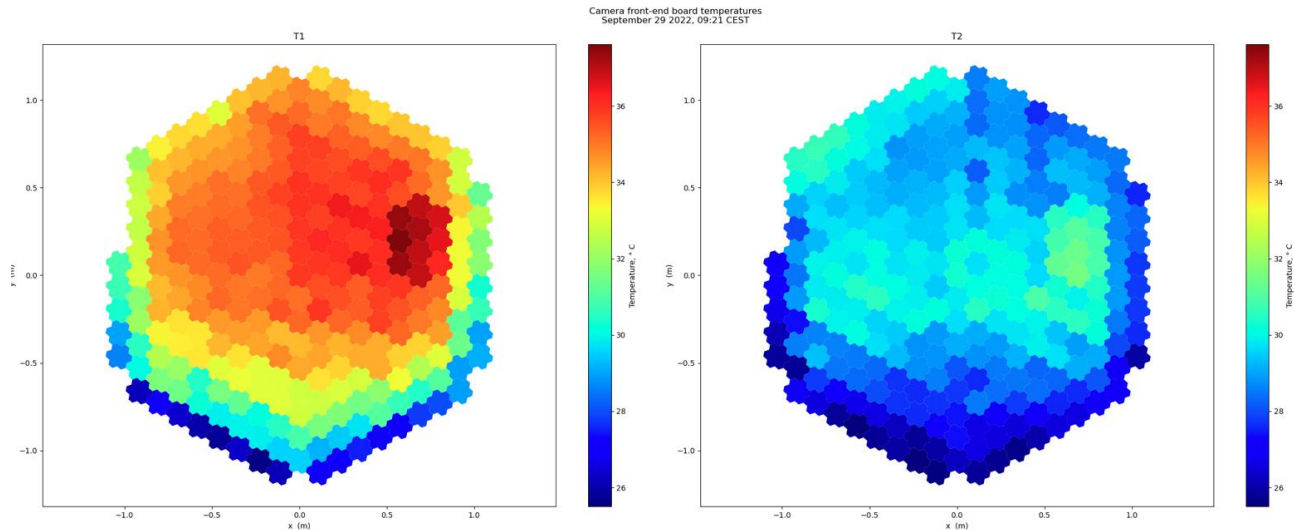
The duration of a test is expected to be around 24 hours

The stabilization time between 2 measurement is about 3h

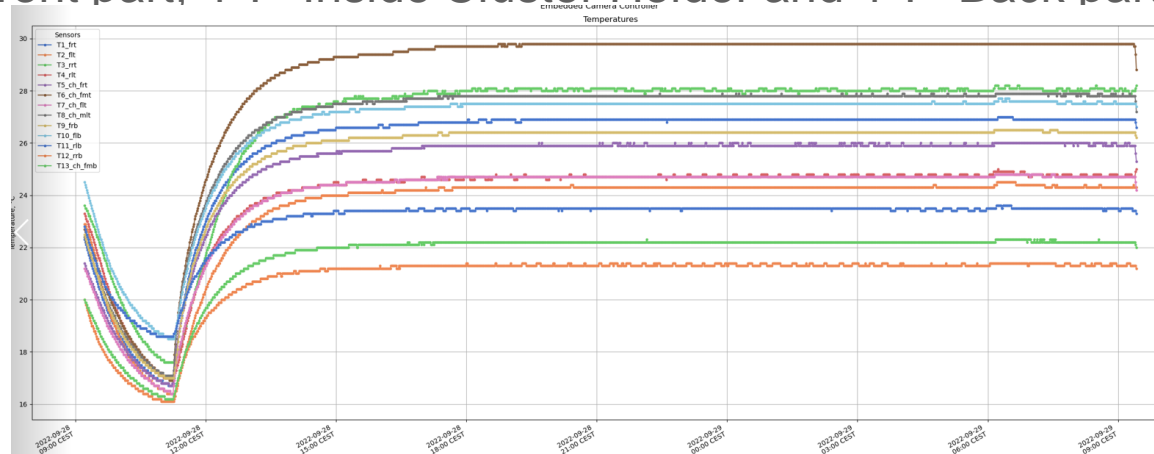
From 0°C, you have to wait 24 hours before you can go down to -5°C (ex: -5°C to -10°C etc...)

Inside the camera, lot of temperature sensors are available

- 2 T° for each Feb (Front and Back)



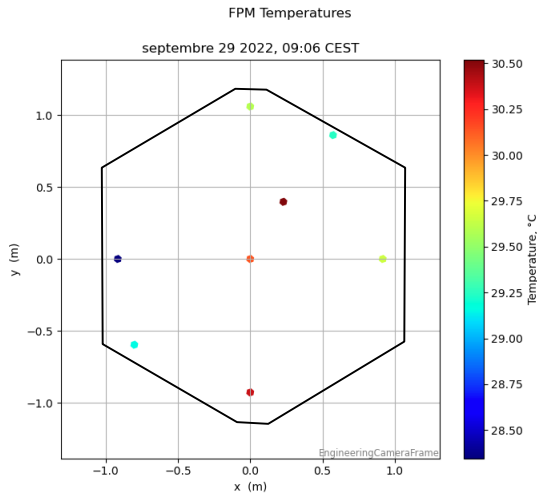
- 4 T° Front part, 4 T° Inside Cluster Holder and 4 T° Back part of the camera



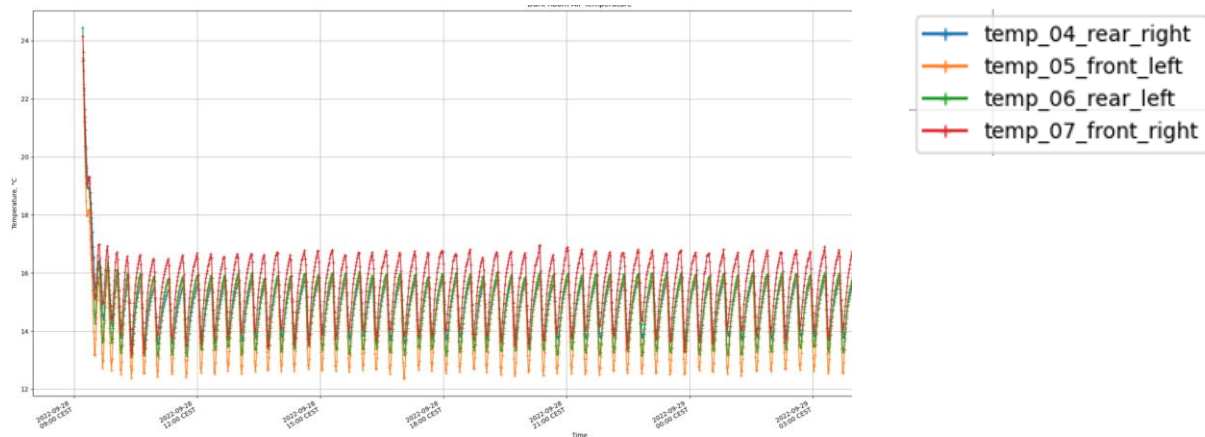
Camera instrumentation for thermal test

For the thermal tests of the camera, additional temperature sensors have been added:

- 8 T° Inside the camera between Detection Unit in the front part of the camera



- 4 T° Outside around the camera

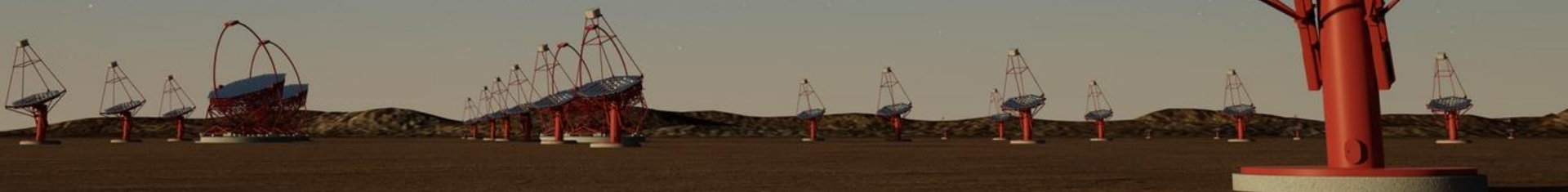




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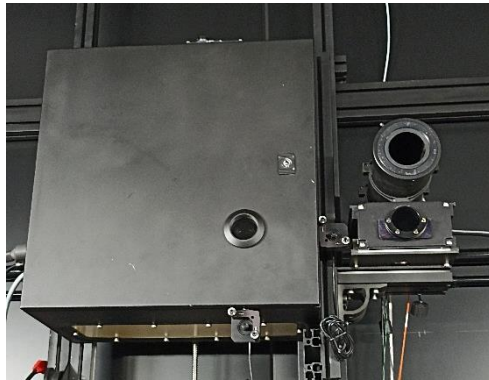


Laser light source



Laser light source

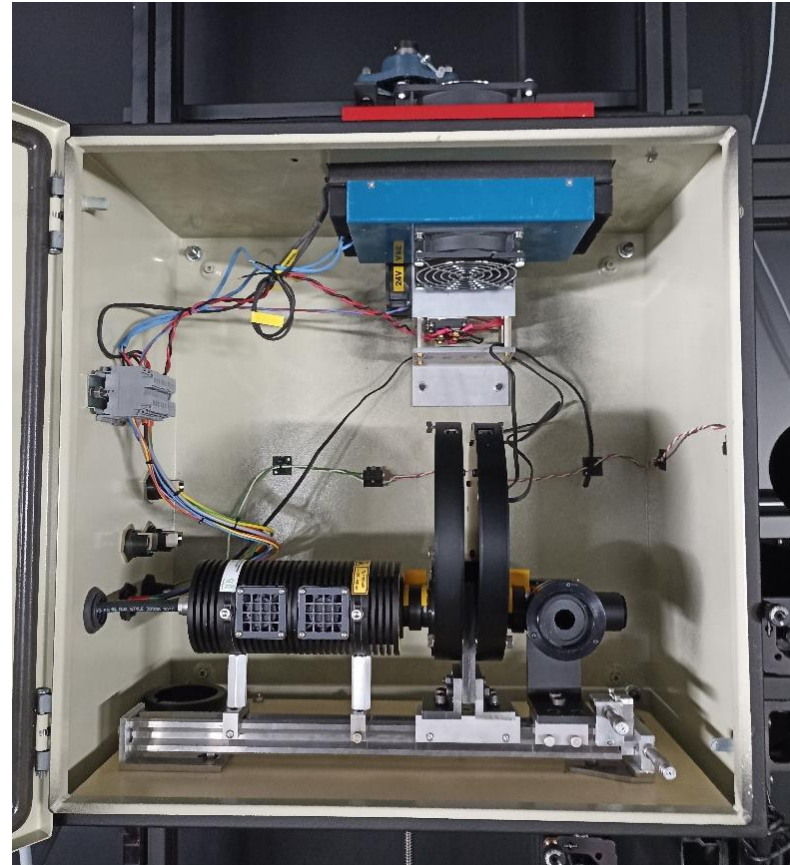
A new laser light source is now used for the tests. This source is located in a thermalized box to keep the laser head at a constant temperature of about 15°C regardless of the T° of the dark room



Light source box



Thermal regulation
of the box

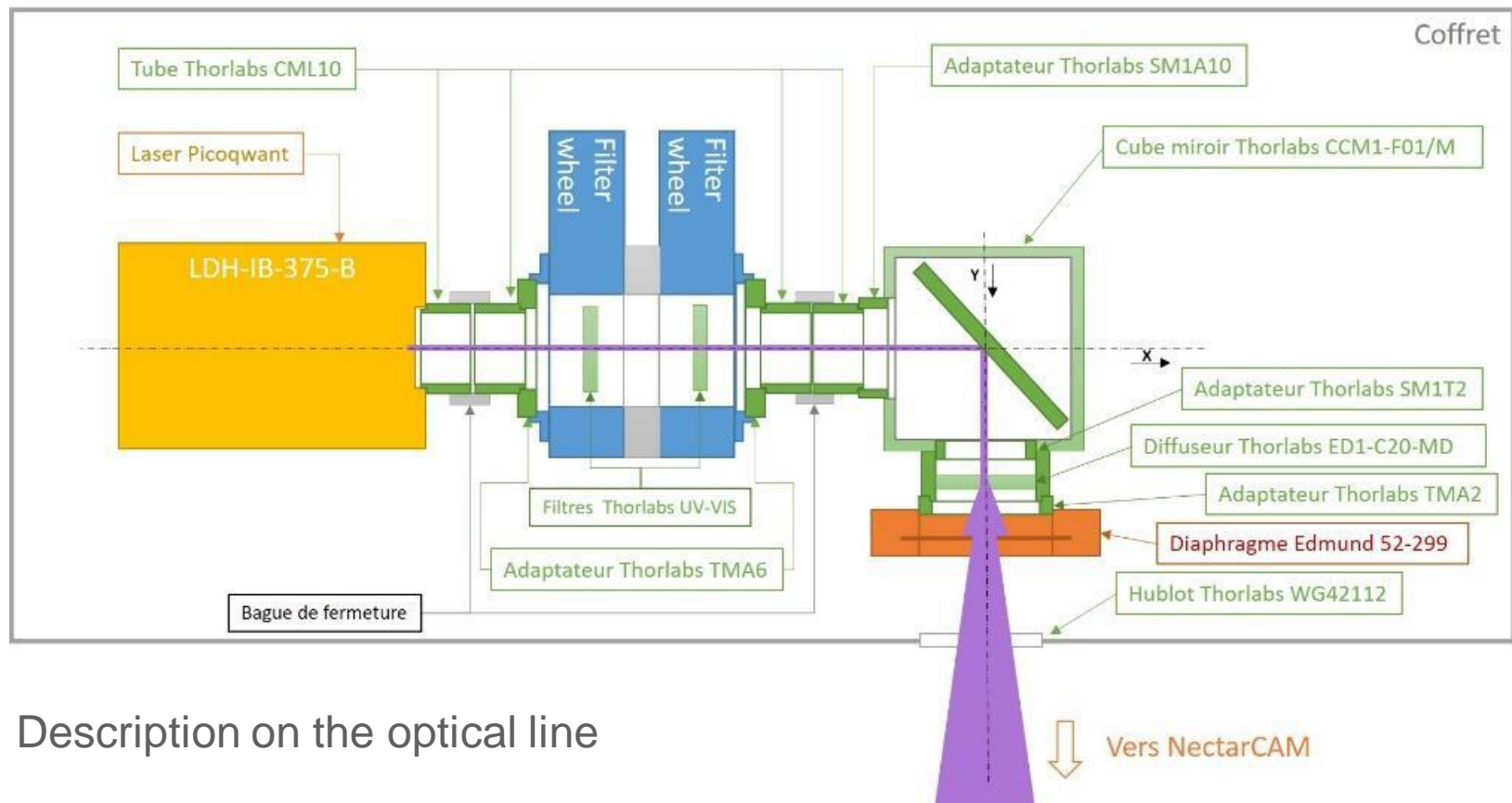


Inside view of the light source box

Laser light source



Head laser Picoquant and Driver Taiko



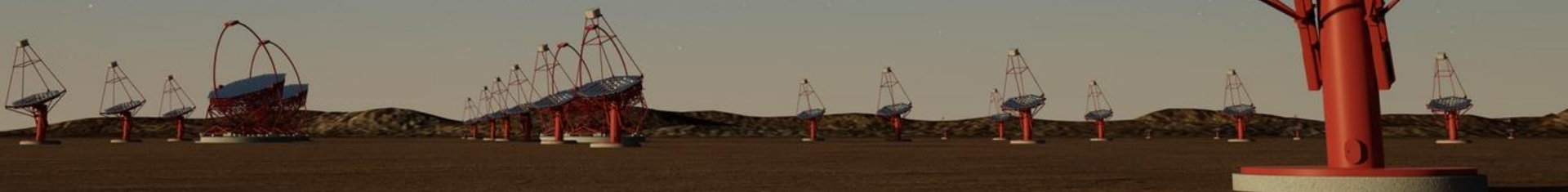
Description on the optical line



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Camera harness & instrumentation



Many different type of elements must be interconnected in the camera

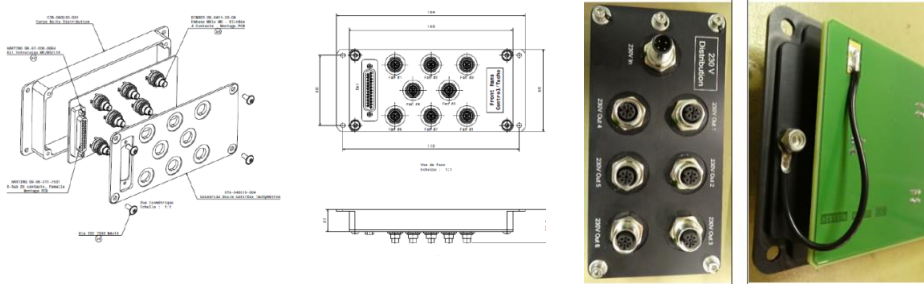
- Fans 220V and control
- Sensors Instrumentation readout
- Electronics modules with power 400V, 220V ,24V and Data (Modules, Ethernet switches, TIB, UCTS, PSB, PDB, ECC, Digital Trigger System, etc..)

Lot of type of parts

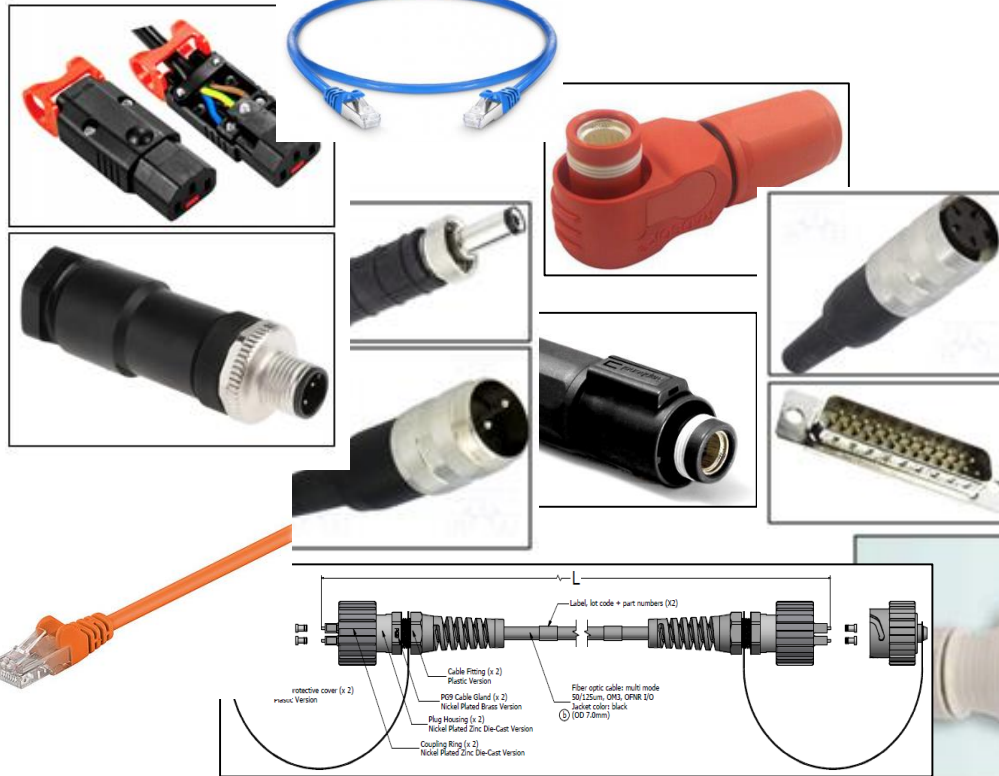
- Distribution boxes (mechanic, connectors and printed circuit board)
- Standard wire data cables (RJ45)
- Standard optical links
- Dedicated data links
- Dedicated power cables
- Sensors on dedicated mechanic

Camera cabling

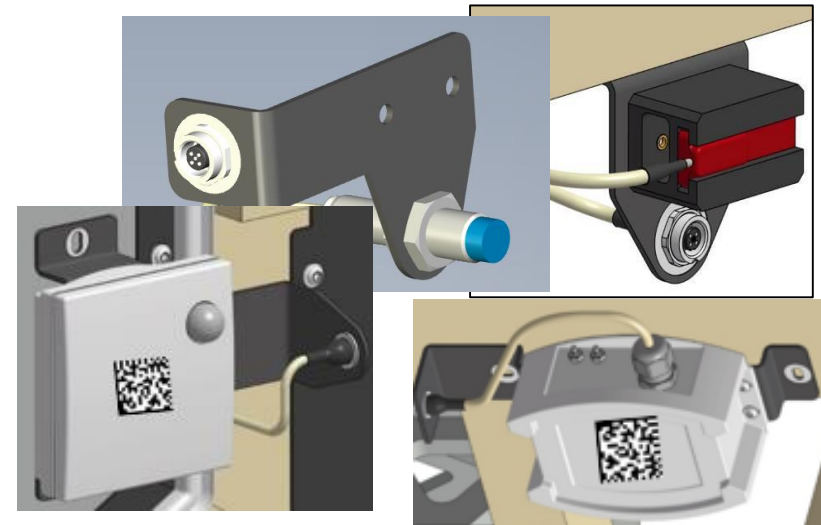
Distributions boxes



Harness, cables (wire & optical)



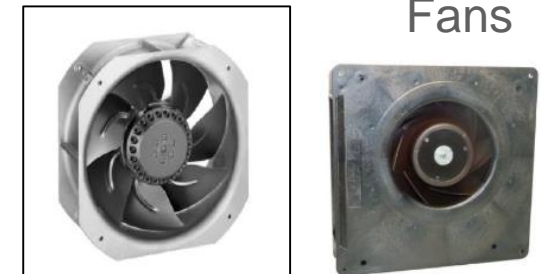
Environmental sensors



Hydraulic circuit sensors



Fans



Very complicated tender due to the large number of different connection types and products.

Unfortunately, we are very late with this tender and hope to have a first version to submit for review in early December

The availability of the fans and the whole hydraulic circuit (heat exchanger, fan and sensors) is necessary for the realization of the camera mechanics. In order not to risk slowing down this production, we will manage the supply of these elements for the first 2 production cameras (Cam 2 and 3) outside the call for tender.

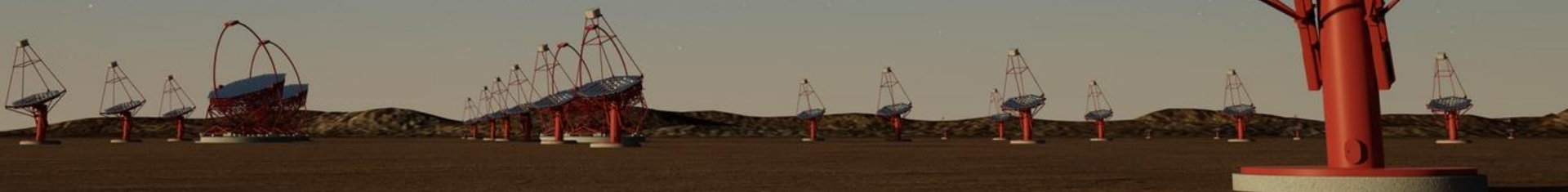
- Elements of the pre-series for the camera 2 -> June 2023
- Elements of the series for camera 3 to 9 and Spare -> October 2023



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RIXes Status



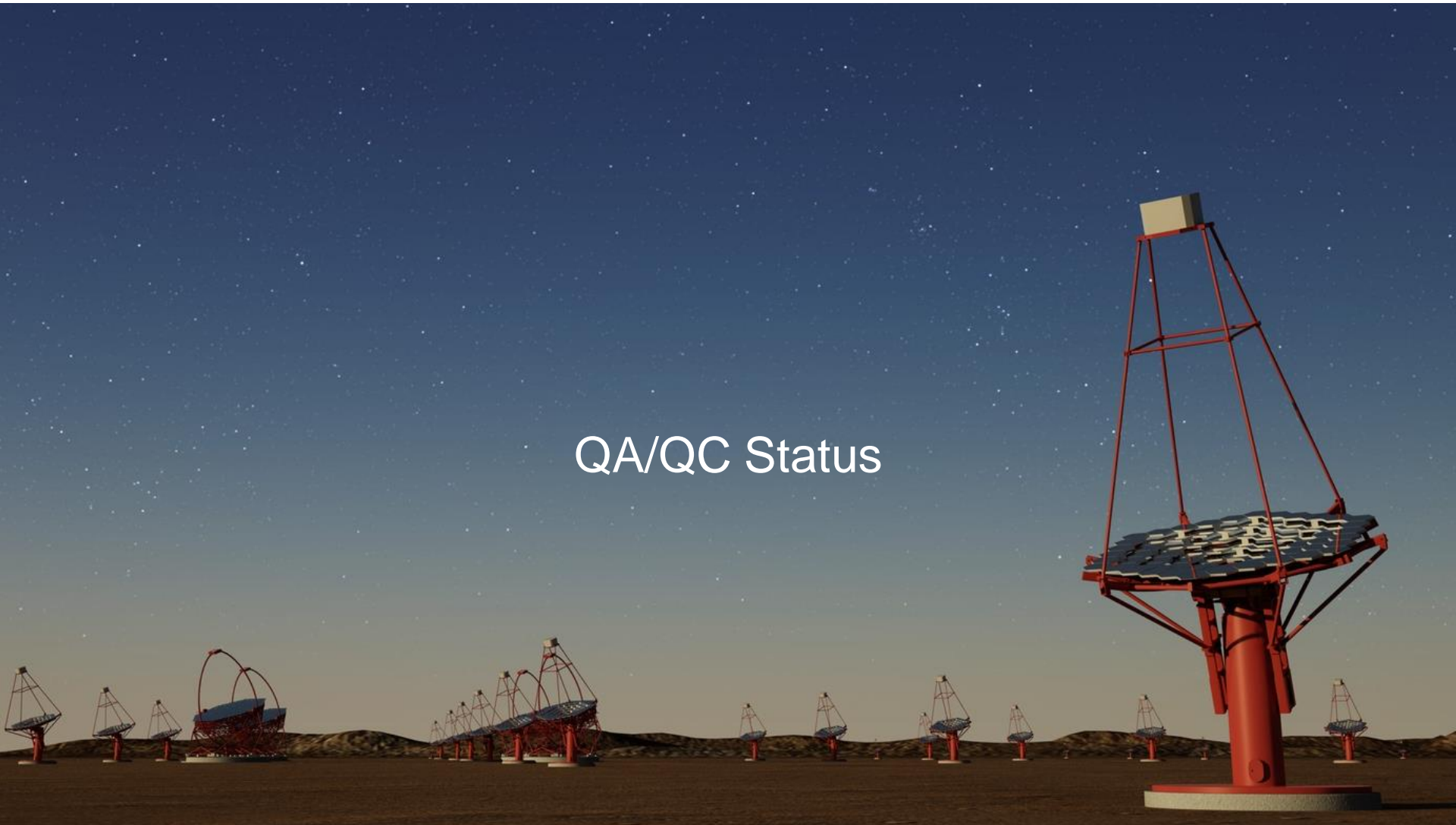
- 5 RIXes non closed
 - 42639 AIV Mounting and maintenance tools / The verification of the design vs. the requirements shall be completed before starting the production
 - 42635 AIV The acceptance of the retractable tunnel as permanent component of the telescope infrastructure shall be done once a design fulfilling the specifications is presented.
 - 42618 Mechanics and cooling Electric patch panel drawing / Please add these references to the document with little text so that it's clear in the document too
 - 42581 RAMS Next version of water proof camera test / Proposed action: All documents to be delivered in English.
 - 42579 RAMS Maintenance tools All 3-4 documents contains references to each other, difficult to follow...I suggest to have one document



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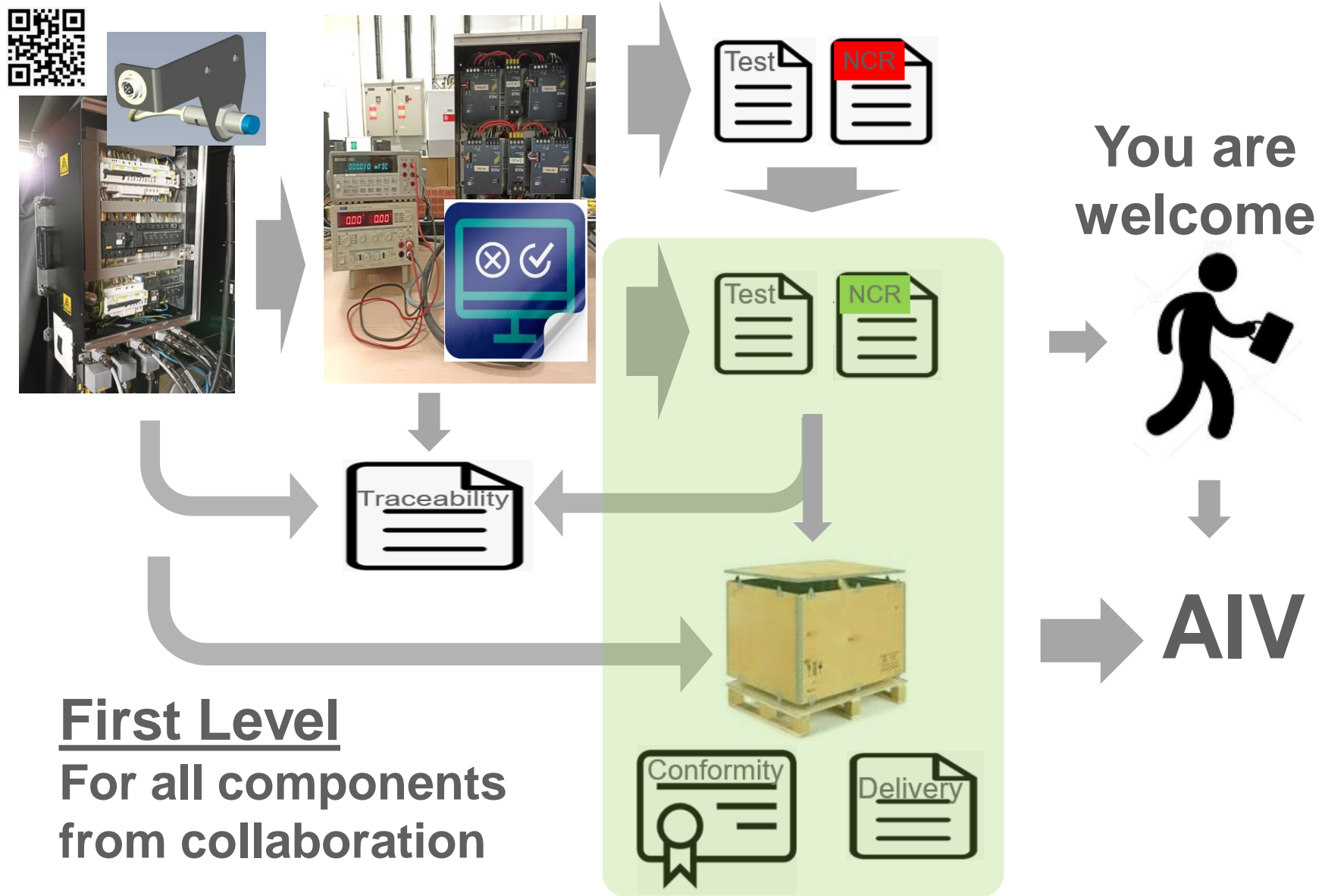


QA/QC Status



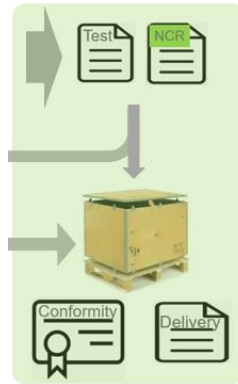
General production process traceability

- During the production process,
 - the follow up of the operations is ensured in **traceability sheets** on the well identified product with **PBS marking**
 - with **non-conformities** opened in case of failure and closed after resolution
 - and the tests carried out must also be recorded in a **test results document**
- All items received at the AIV site must be accompanied by these documents, a **Delivery sheet** and a **Certificate of conformity**
- An **Incoming record sheet is then** completed at the AIV site for traceability

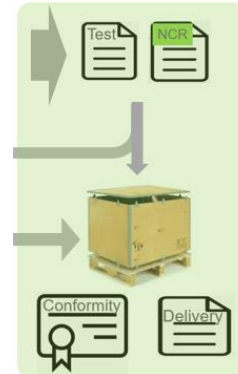


Second Level

For all components
from collaboration





For all components
provided by IRFU : PSB,
PDB, DTC, Harness,
Instrumentation




Camera tests reports
Camera Integration NCR
Camera configuration



ADP
Acceptance Data Package
for the delivered camera
to the Observatory

				Local Non-Conformance Report		Ref: MST-CAM-NCR-XXX Revision : 1.0 Revision Date: Page : 1/2	
Originator				Date			
Title							
Equipment information							
Equipment							
Model							
Subsystem / Item							
Serial Number				Supplier			
Non-conformance information							
Detection phase		<input type="checkbox"/> Incoming Inspection <input type="checkbox"/> Control / test <input type="checkbox"/> Manufacturing <input type="checkbox"/> Integration		<input type="checkbox"/> Qualification <input type="checkbox"/> Acceptance <input type="checkbox"/> Other : _____			
Non-conformance description							
Analysis / Causes							
Classification		<input type="checkbox"/> Minor		<input type="checkbox"/> Major			
Preventive (P) and corrective (C) actions							
Type (P or C)		Description		Date of realization			
Final disposition and Approbation							
Action review (Date + efficiency of actions)							
Final disposition		<input type="checkbox"/> No action <input type="checkbox"/> Use as is <input type="checkbox"/> Repair <input type="checkbox"/> Modification <input type="checkbox"/> Scrap <input type="checkbox"/> Return to supplier <input type="checkbox"/> Doc. Correction <input type="checkbox"/> Major NCR opened		Change or waiver request reference _____ Other/ Precisions _____ N° NCR: _____			
		Engineering manager		Quality Manager		Project Manager	
Dates and names							
Closure							
Closed by				Closure date			

Local NCR template V1.0

	MST-CAM / NectarCAM	Ref. : MST-CAM-RP-SeqNbr_COC
	Certificate of Conformity	Date: xx/xx/xxxx

Certificate of Conformity

THE ENDORSEMENT HEREIN CERTIFY THAT THE ITEM OFFERED FOR ACCEPTANCE HAS BEEN DESIGNED, MANUFACTURED, ASSEMBLED AND TESTED IN ACCORDANCE WITH APPROVED CONFIGURATION AND COMPLIES IN ALL RESPECTS WITH CONTRACT REQUIREMENTS EXCEPT AS RECORDED IN THE LIST OF EXCEPTIONS OF THIS CERTIFICATE.

Designation/Equipment:	Supplier, entity name & address:	
Model:	Ref. n°:	Part n°:
Contract n°:	Spec n°:	Component Item :

The following is certified	Exceptions
<ol style="list-style-type: none"> The article complies with configuration baseline and is accurately described by the configuration documents. Verification has been successfully completed. The article design complies with requirements for safety. The relevant ADP is complete and available for shipment with the article. Open work / tests and unresolved NCR defined in the ADP are acceptable for transfer to the user site. 	
We hereby declare, All the relevant information concerning the products listed in the enclosed documentation has been entered into the database of the NectarCAM project and the product are ready for the use hereby declared.	

Contractor:	Customer:	
Product Responsible:	Date:	Phone:
Local Responsible of NectarCAM:	Date:	Phone:
LQC:	Date:	Phone:

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