



AMS TIM

CERN- 25th July 2005



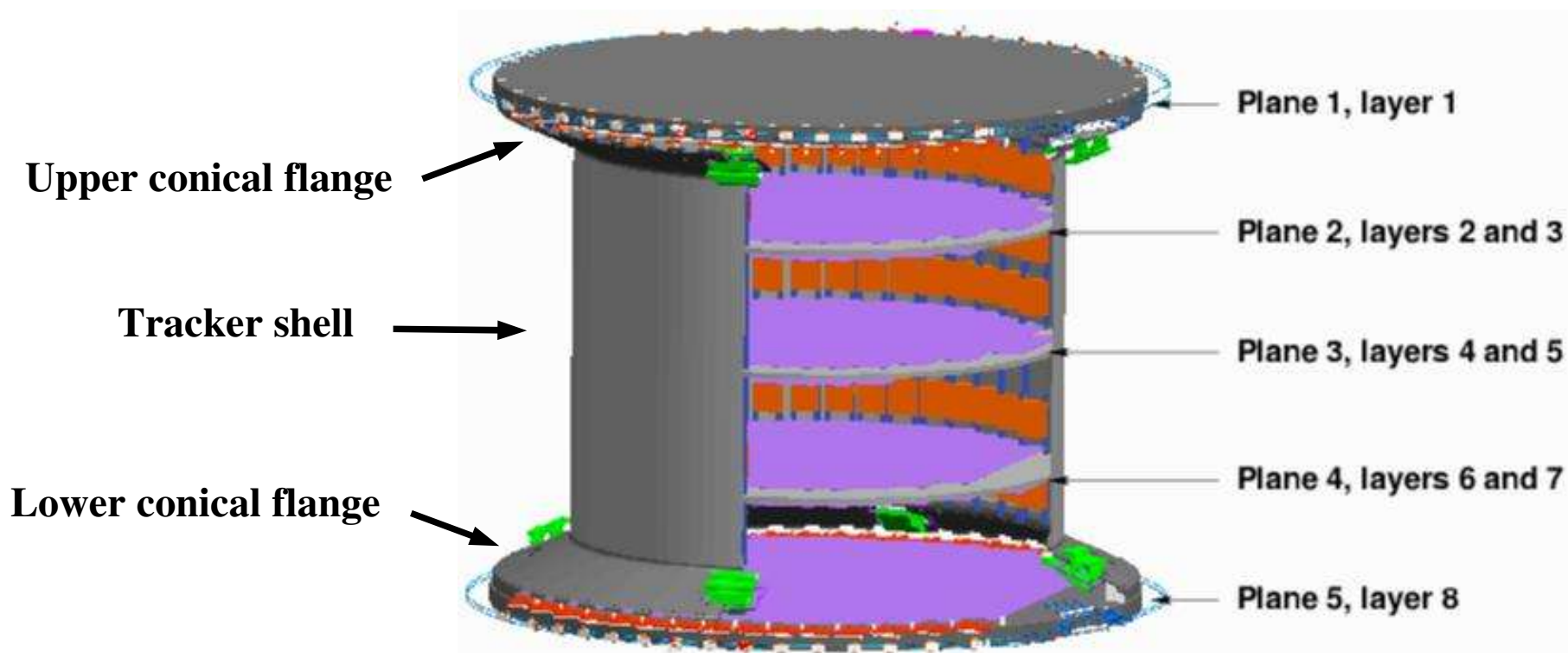
AMS-02 Tracker Integration Status

Mercedes Paniccia

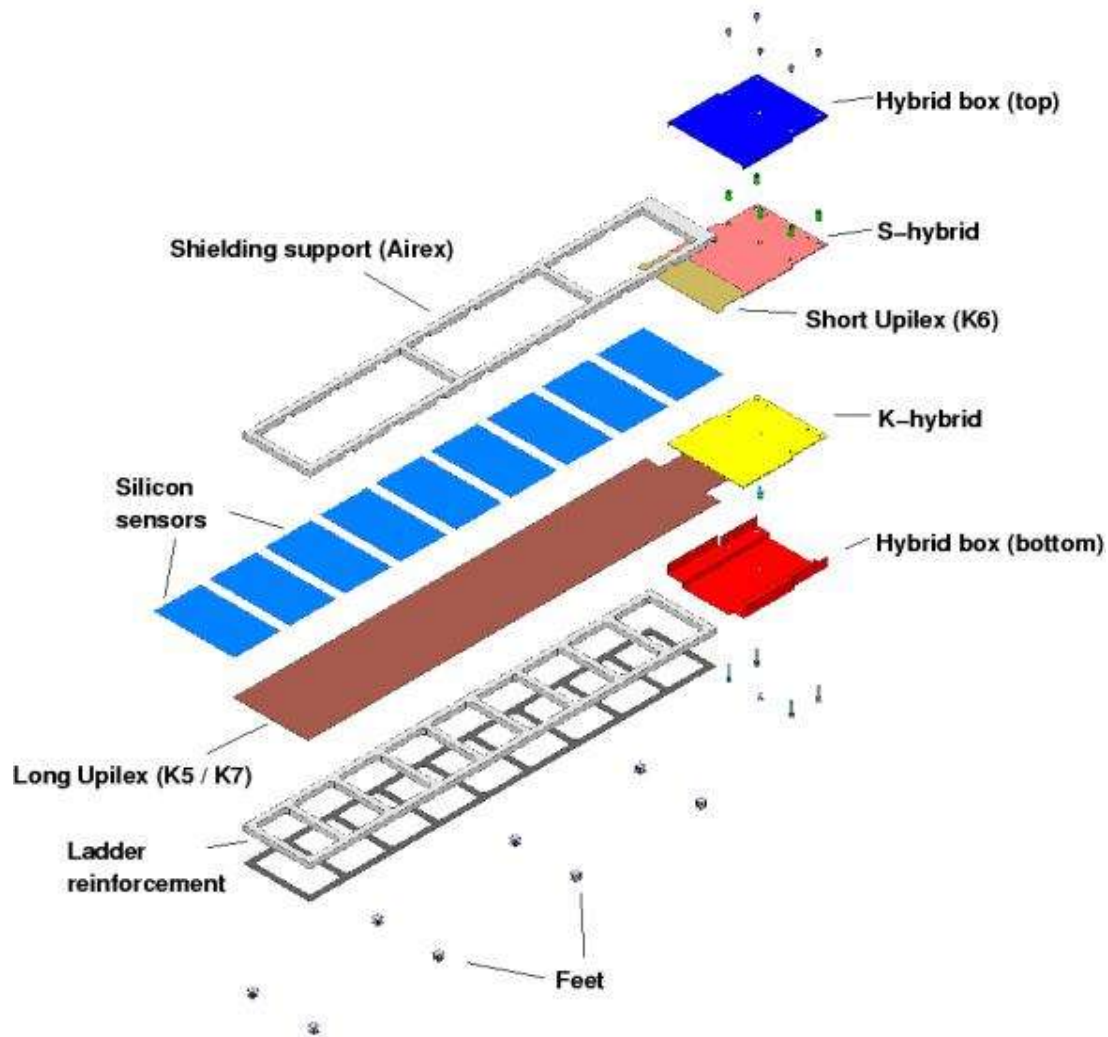
University of Geneva

The AMS-02 Silicon Tracker:

2500 double-sided-silicon-microstrip sensors arranged in 192 ladders, installed in eight layers of about 1 m² each, on five planes of an ultra-light support structure.



Ladders structure:

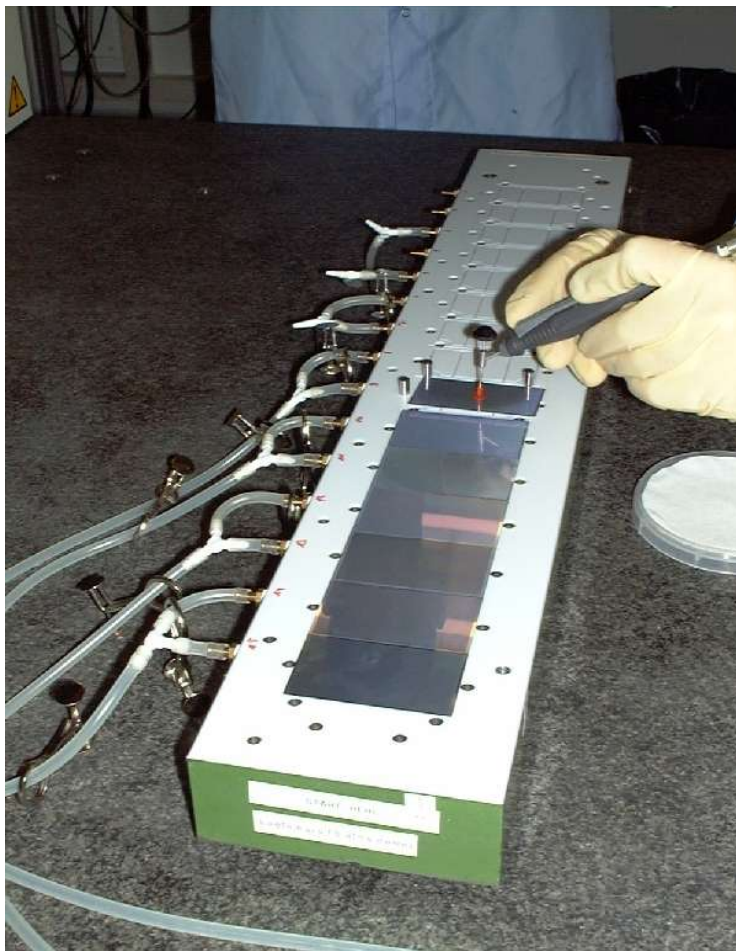


Ladders assembly sequence(1):

Silicon sensors and front-end electronics assembly



Bonding



Ladders assembly sequence (2):

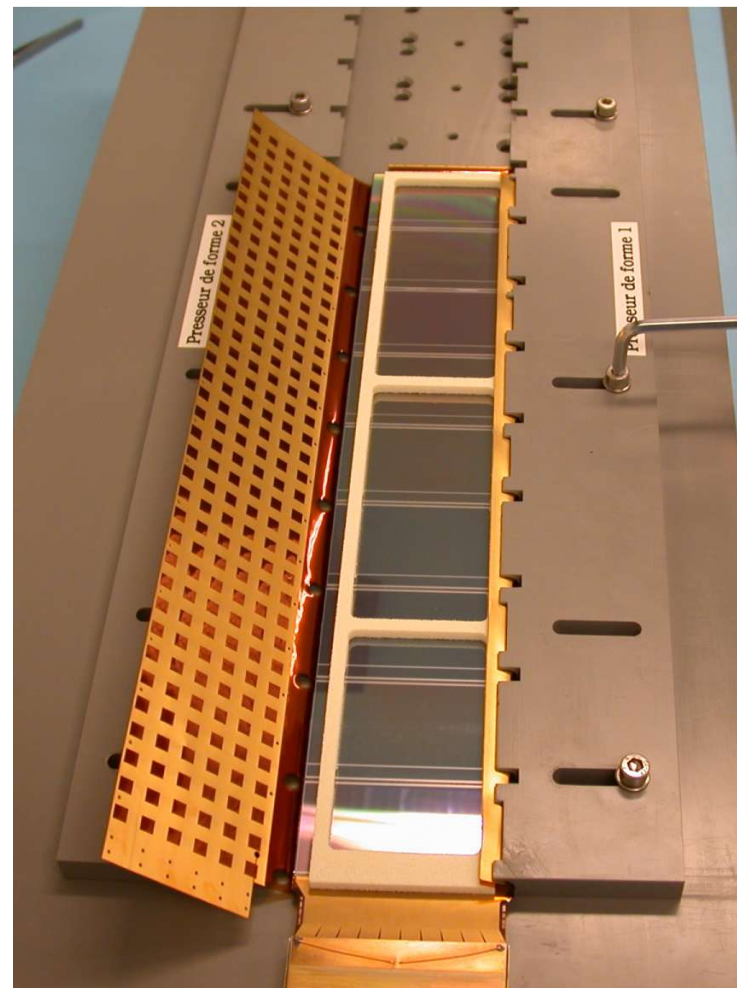
Phase-2 (feet, hybrid box)



Shielding



Mercedes Paniccia

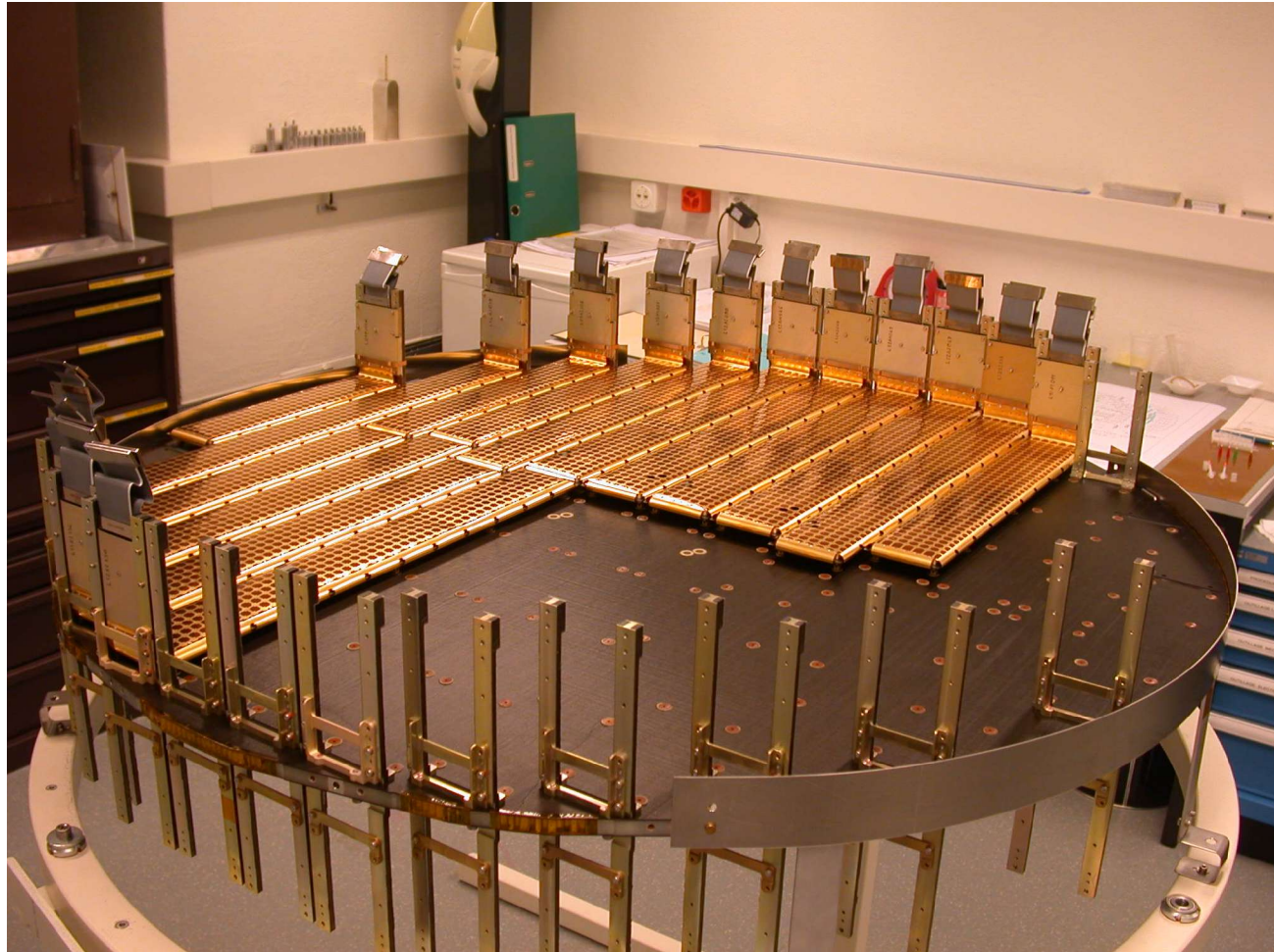


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Layers assembly :

Integration on planes





Summary of silicon ladders production:

- 2001-2004 :

UNIVERSITY and INFN PERUGIA: 13 ladders

UNIVERSITY of GENEVA: 18 ladders

G&A Engineering (Italy): 163 ladders

- 2005:

G&A Engineering (Italy): 19 ladders

End of production at G&A: August 2005



Assembly status of flight ladders:

- Installed on planes: 88
- Assembly completed: 37
- Ready to be shielded: 46
- On phase-2: 8
- Under tests: 10
- On production: 3

End of phase-2: September 2005

End of ladder assembly: December 2005



Layers integration summary:

- Fully integrated layers:
 - 4 Inner (L2, L4, L5, L7)
 - Qualification tests successfully completed
- Layers ready to be equipped with ladders:
 - 2 Inner (L3, L6)
 - 2 Outer (L1, L8)
 - Outer planes have been equipped with thermal bars

Ladders installation on planes will restart this week

End of layers integration: December 2005



Plane 2 summary:

Layer L2:

Installation completed

Qualification test successfully completed

Layer L3:

9/22 ladders ready to be installed

5/22 on shielding

3/22 on phase-2

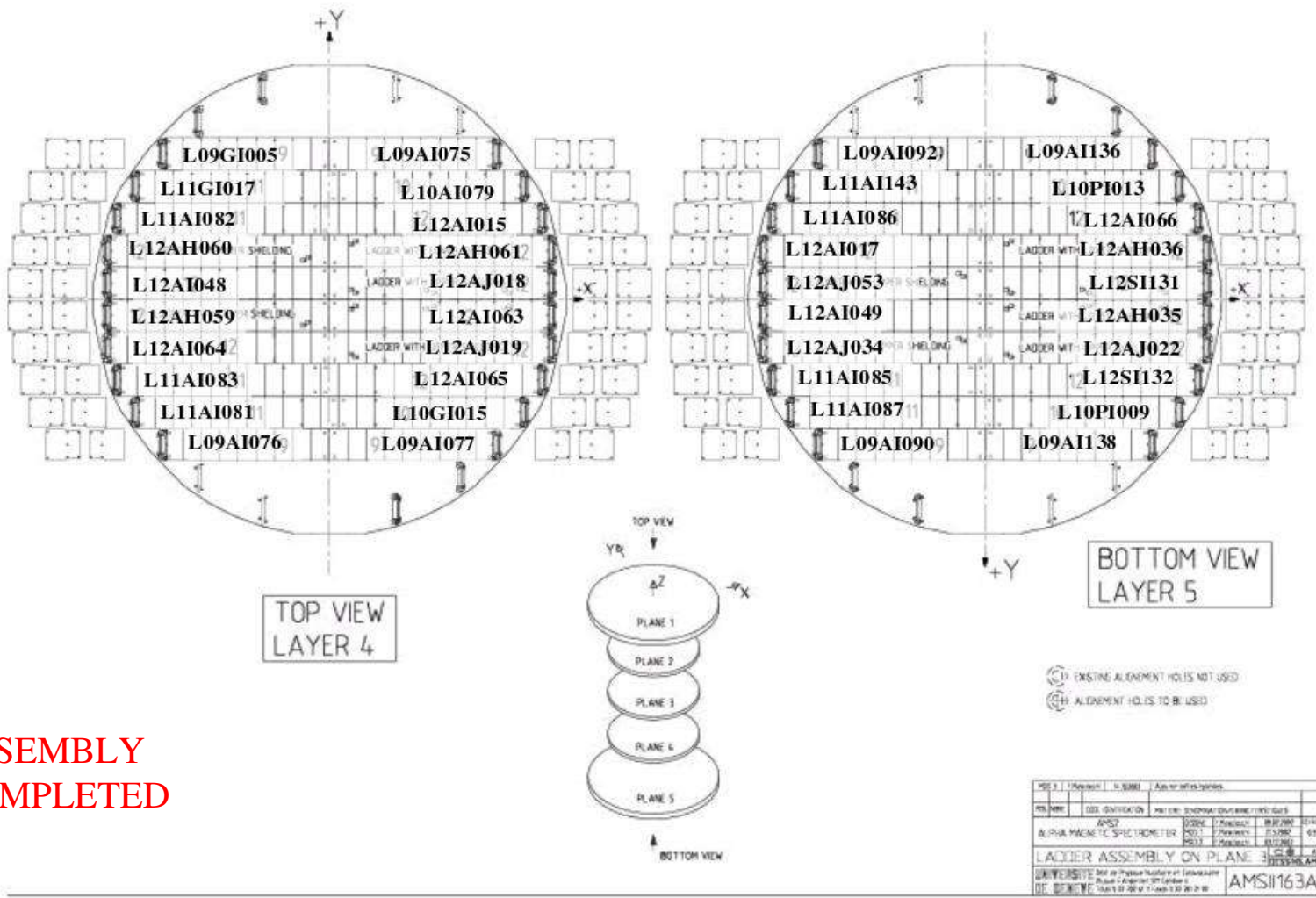
4/22 under tests

1/22 being produced



AMS-02 Tracker - Plane 3

October 14, 2004



ASSEMBLY COMPLETED



Plane 3 Summary:

Installation completed

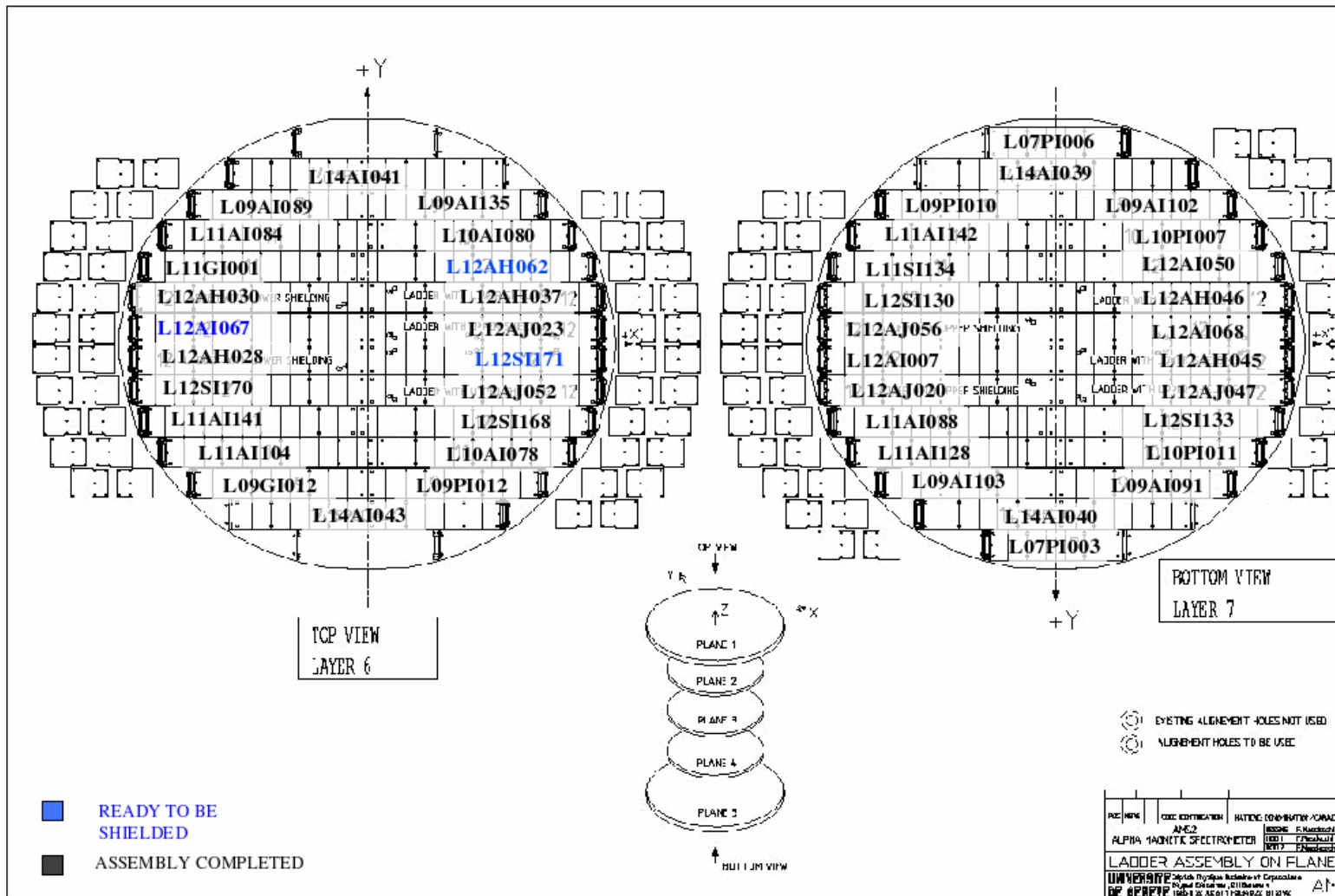
Qualification test successfully completed





AMS-02 Tracker - Plane 4

July 19, 2005





Plane 4 summary:

Layer L7:

Installation and qualification test successfully completed

Layer L6:

19/22 ladders ready to be installed

3/22 on shielding

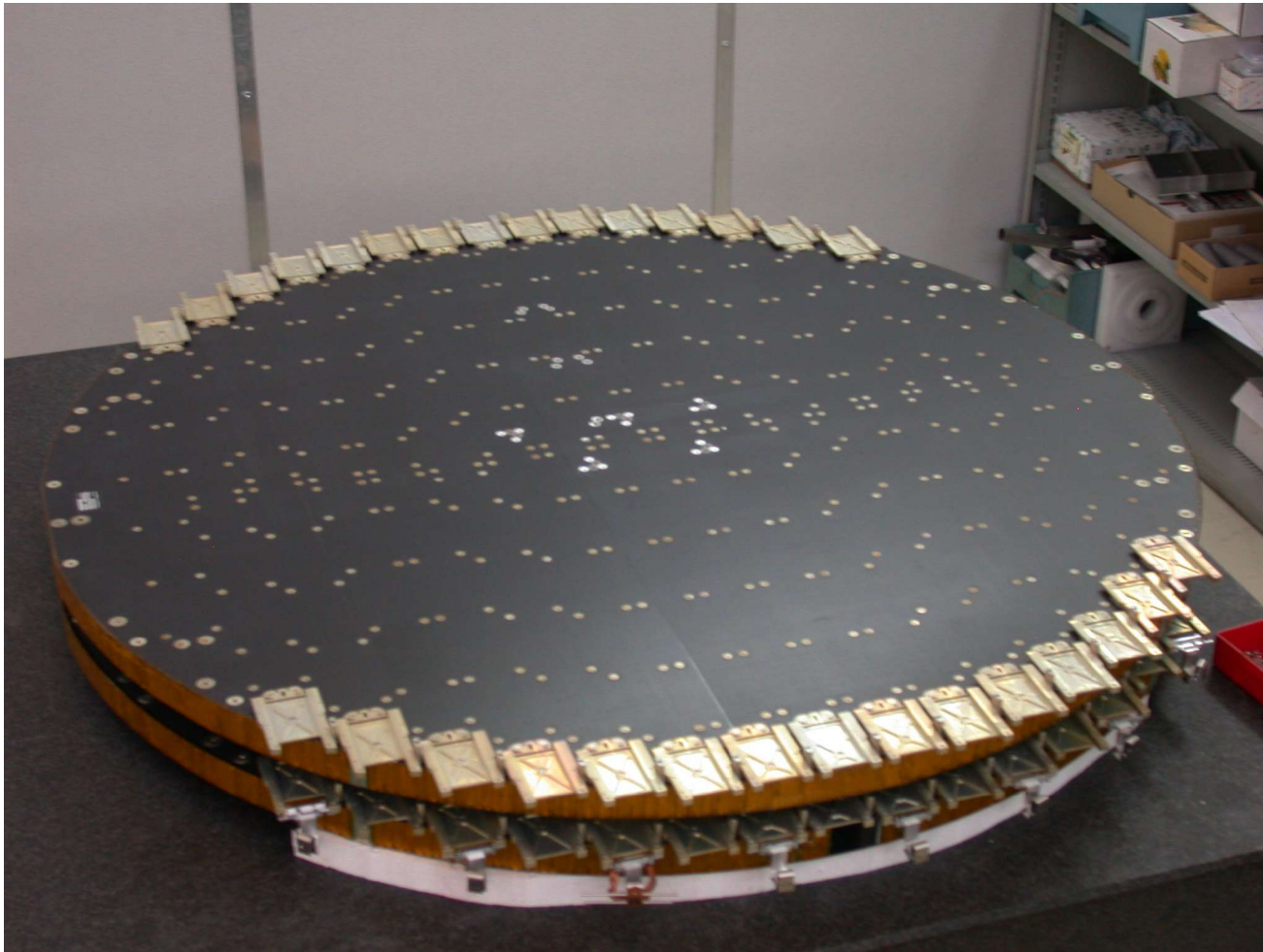
Ladder installation will start this week





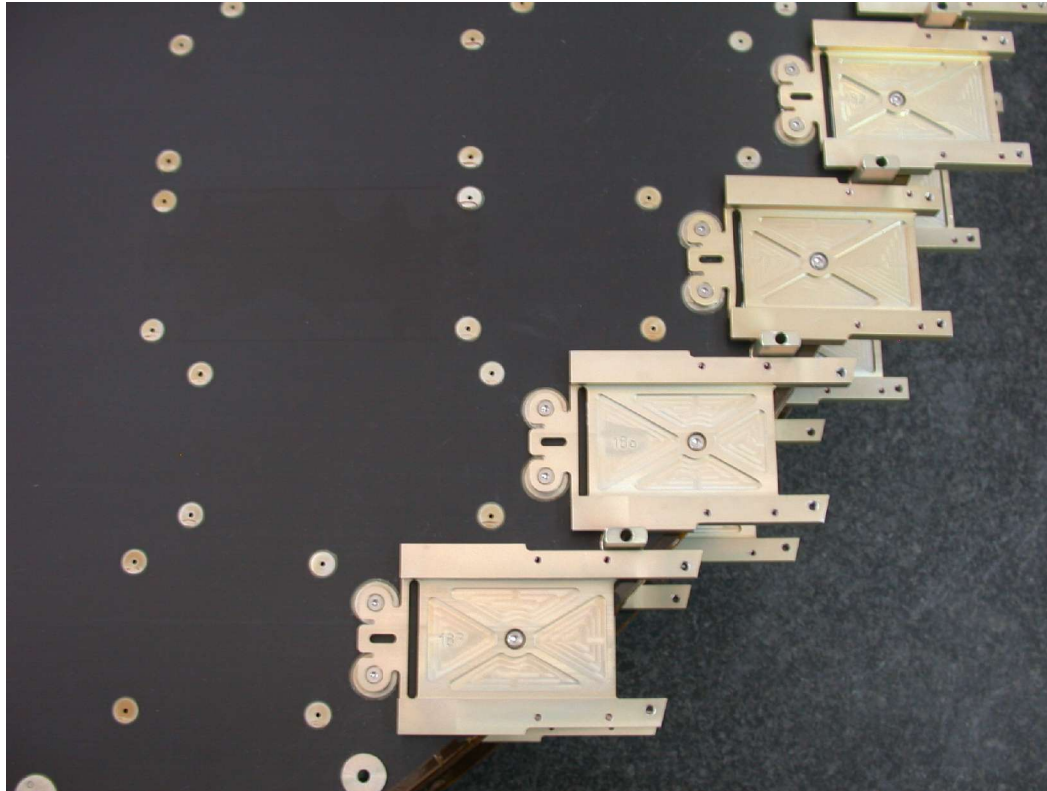
Outer planes:

Ready for ladders installation.



Outer planes: detail on thermal bars

Al plates bonded between plane and thermal bars to improve thermal contact.

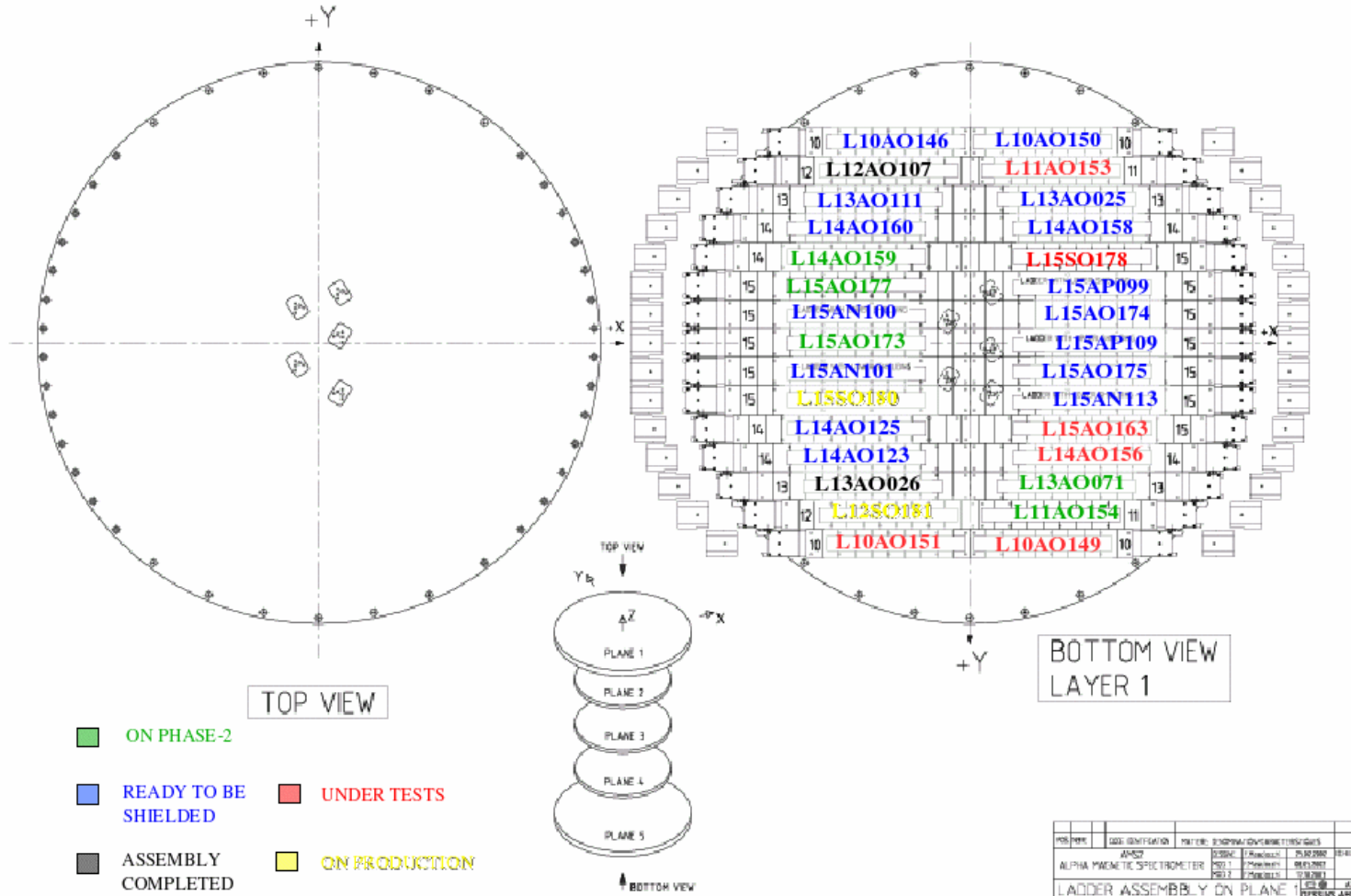


Light tightness method between thermal bars and plane defined:
CV Silicone adhesive (CV-1142-2 -- Nusil (USA))



AMS-02 Tracker - Plane 1

July 21, 2005

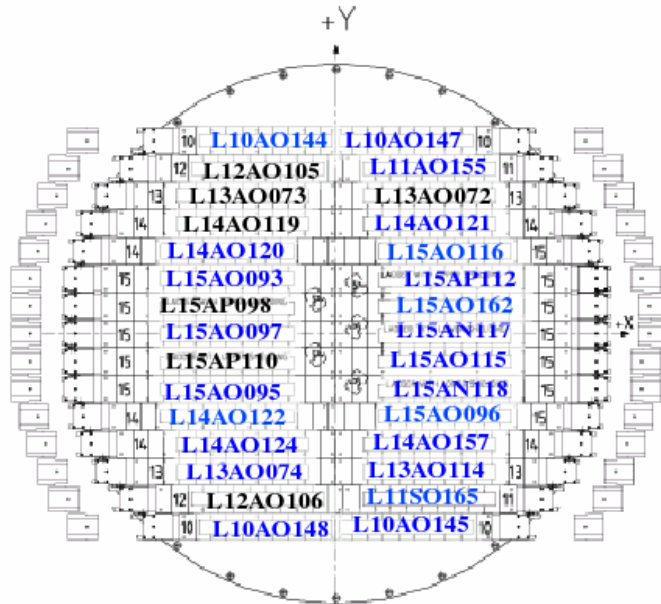


PROJ. NO.	AMS-02	PROJ. NO.	AMS-02
ALPHA PARTICLE SPECTROMETER		ALPHA PARTICLE SPECTROMETER	
LADDER ASSEMBLY ON PLANE 1			
AMS1165A1			

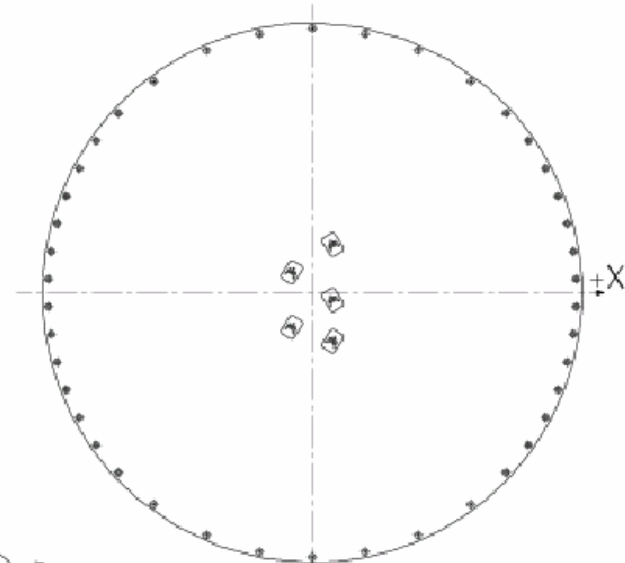


AMS-02 Tracker - Plane 5

July 19, 2005

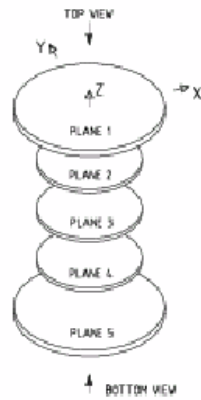


TOP VIEW
LAYER 8



BOTTOM VIEW

- READY TO BE SHIELDED
- ASSEMBLY COMPLETED



↑ BOTTOM VIEW

REV.	NO.	CODE IDENTIFICATION	DATE	BY	REVISIONS	REVISIONS
		AMS02			25.02.2005	1
		ALPHA MAGNETIC SPECTROMETER			27.02.2005	1
					19.07.2005	1
LADDER ASSEMBLY ON PLANE 5						AMS1166A1
UNIVERSITE DE GENÈVE Institut de Physique de l'Université de Genève						
DE GENÈVE						



Outer planes: ladders assembly status

- Plane 1:

- Layer L1: 2/30 ladders ready to be installed
 - 15/30 on shielding
 - 5/30 on phase-2
 - 6/30 under tests
 - 2/30 being produced

- Plane 5:

- Layer L8: 7/30 ladders ready to be installed
 - 23/30 on shielding



Layers integration planning:

driven by ladders availability, manpower and logistics

Plane 4:

all ladders installed on L6: **end of August**

qualification tests on L6 completed: **beginning of September**

Plane 5 integration + qualification tests:

mid September -> end of October

Layer 3 integration + qualification tests:

not earlier than November

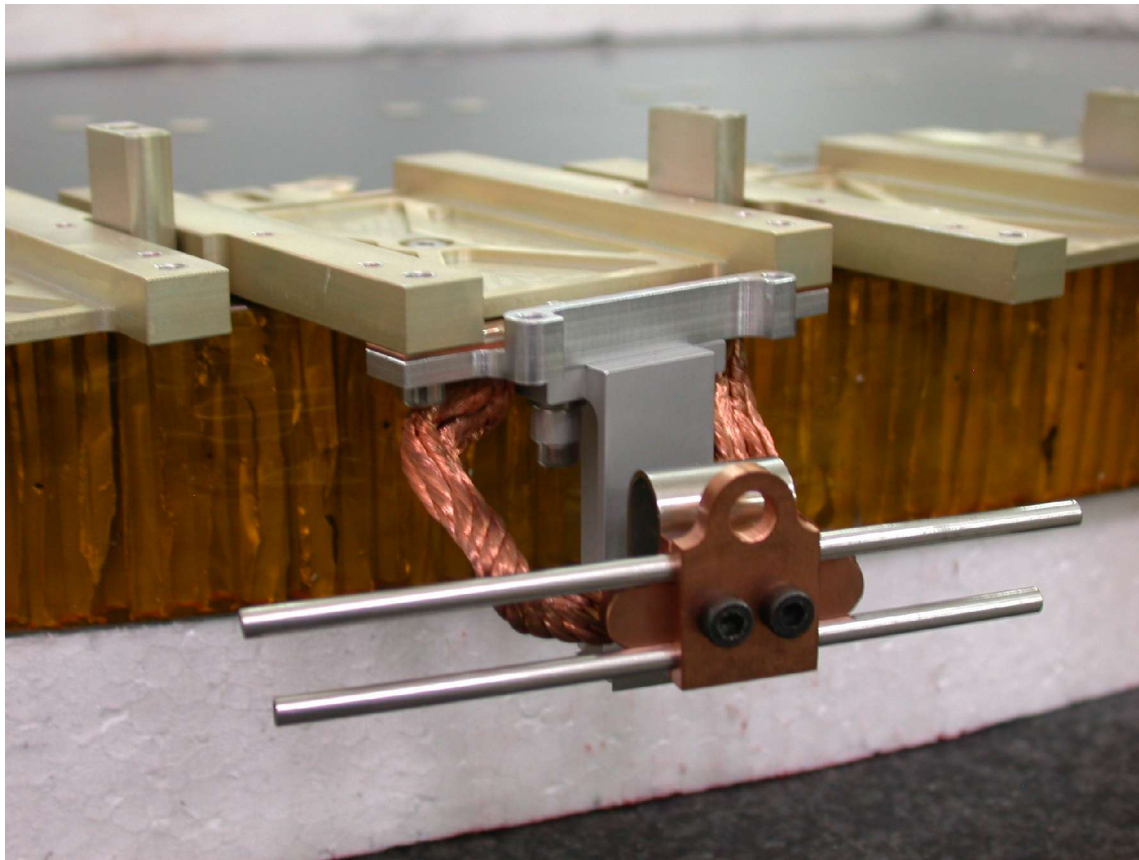
Plane 1 integration + qualification tests:

not earlier than December

Outer planes:

thermal connection between thermal bars and evaporators

- done via copper braids
- dry assembly of all components completed



Tracker shell:

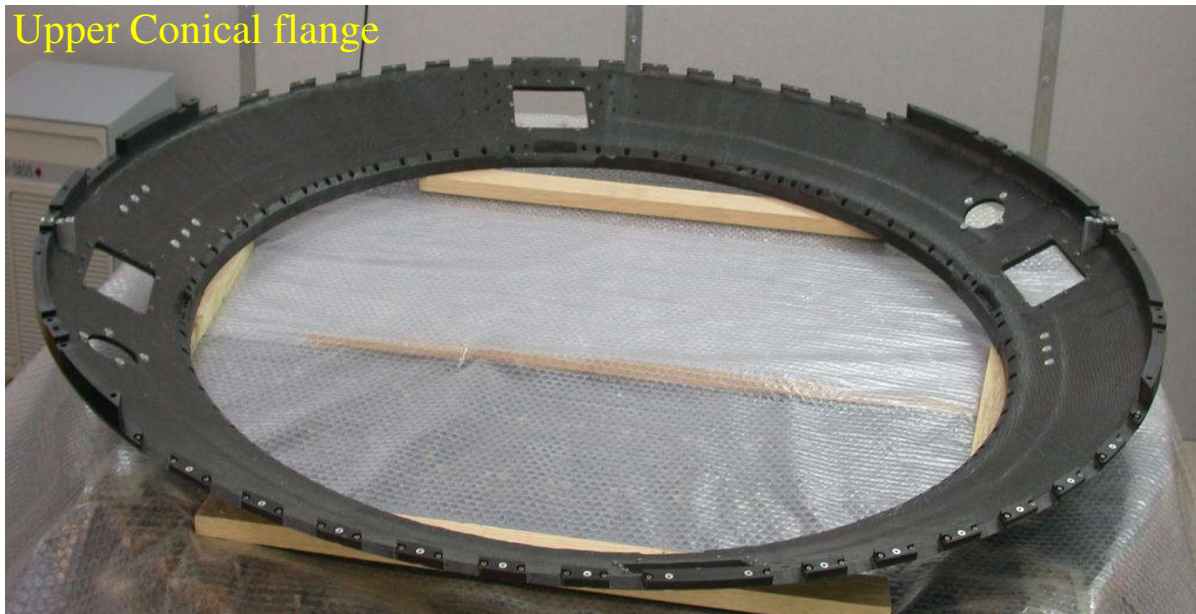
Ready





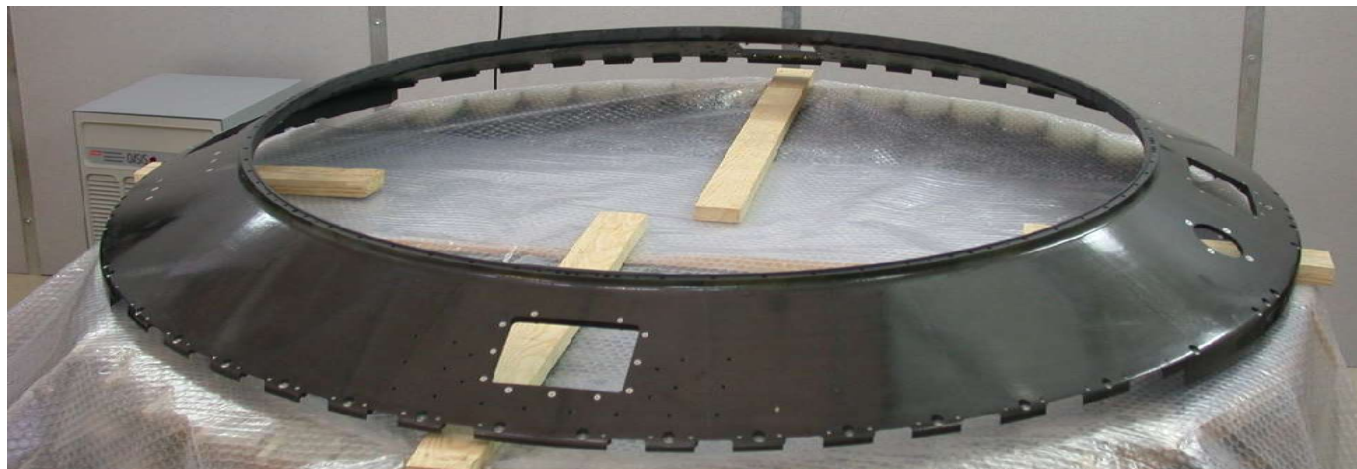
Conical flanges: **Delivered to Geneva**

Upper Conical flange



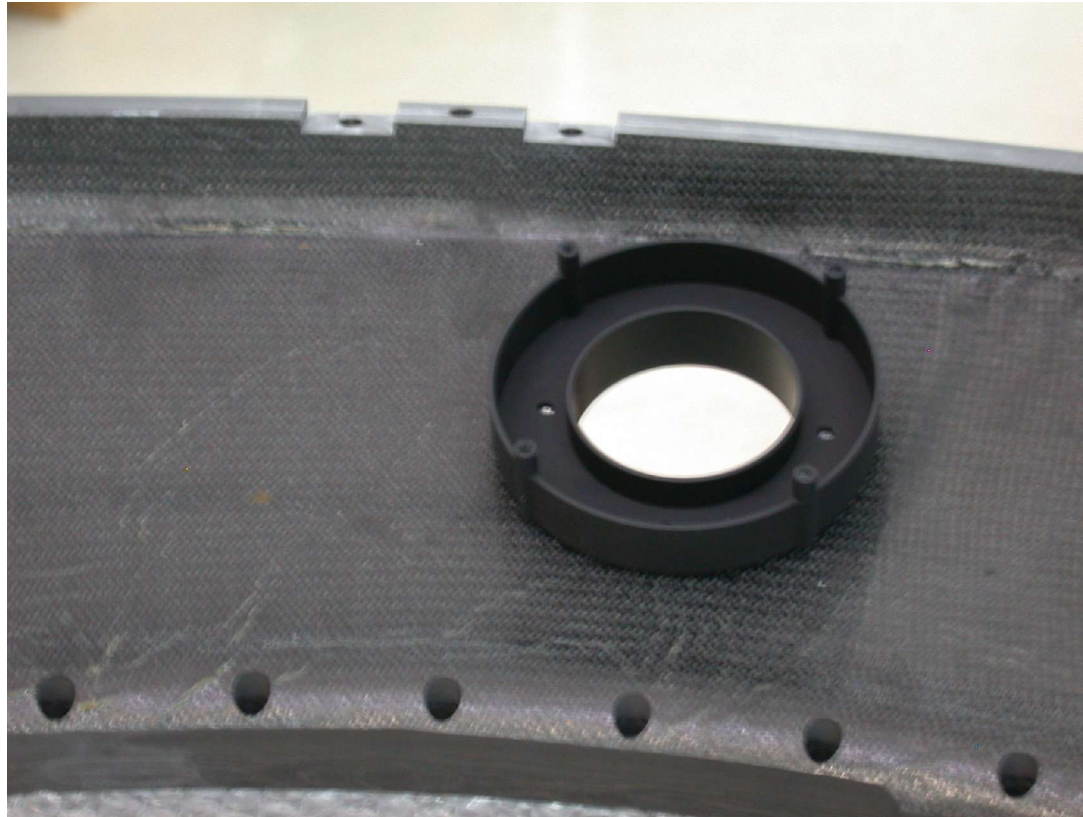
- The two flanges have been:
- laminated by FVT
 - machined by IPT
 - Insert bonded by RWTH
 - Final machining by IPT (Aachen)

Upper Conical flange
upside down



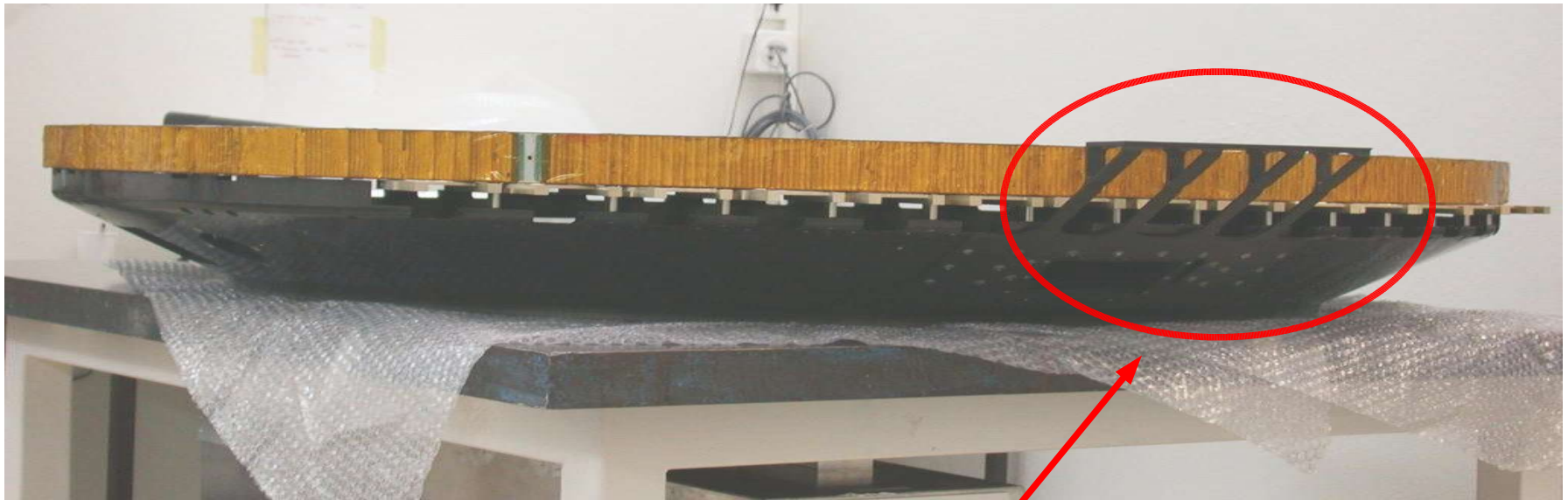
Conical flanges:

light trap on top of upper conical flange



Conical flanges and outer planes dry assembly ongoing

Plane 1 on top of upper conical flange



Amica Star Tracker Lower Support
(Qualification Model)



Star Tracker carbon fiber QM supports at Geneva for a quick interfaces check





Schedule :

Dry assembly of Tracker structure: **ongoing**

Bonding of Star-Tracker brackets: **Autumn 2005**

All 5 planes completed with ladders: **End of 2005**

Inner Tracker assembled: **Late Autumn 2005**

Evaporators dry assembly: **Beginning of 2006**

At this stage the Tracker will be ready for transport to CERN