



Tracker Integration Status at UNIGE



Ladders in Geneva : 184

- ***installed on planes : 88***
(all successfully tested)
- ***assembly completed : 37 (28 inner + 9 outer)****
(6 inner to be tested after shielding wrapping)
- ***on shielding phase : 45 (8 inner + 37 outer)****
(3 inner and 6 outer to be tested after legs gluing)
- ***on phase-2 : 4 (1 inner + 3 outer)***
- ***to be repaired : 0***
- ***ready for bonding after reparation : 1***
- ***stand-by : 3 (1 inner + 2 outer)***
- ***rejected : 6 (1xL11Inner + 4xL12Inner + 1xL15Outer)***

**** Airex light tight to be insulated and external airex to be glued on hybrids box of some outer ladders***



Ladders reparation summary :

Assembly Status	Type of reparation	Hybrid used for rep.	Reparation done on	Bonding done	Quality after rep/bond	Location
Inner						
L09 GI 002	Un-shielded, feet glued	S-Hybrid replacement	2024-5-191	20/06/05	yes Good	Geneve
L09 GI 011	Un-shielded, feet glued	S-Hybrid replacement	2024-5-207	23/06/05	yes Good	Geneve
L11 AI 127	Hybrid assembled	S-Hybrid replacement	2024-5-201	28/06/05		Geneve
L12 AH 062	Hybrid assembled	VA 14 replacement		27/05/05	yes Good	Geneve
L12 AI 012	Feet glued	(RCAMS 16 replacement) Kapton K5 VA and RCAMS 4 replacement		15/06/05 07/07/05	yes Low saw RCAMS 4	Perugia
L12 AJ 038	Hybrid assembled	K-Hybrid replacement S-Hybrid replacement	2025-5-241 2024-5-159	06/07/05 07/07/05		Perugia
L12 SI 167	Hybrid assembled	S-Hybrid replacement K-Hybrid replacement	2024-5-161 2025-5-274	21/06/05 21/06/05	yes some noisy channels	Travel PG-GVA
L14 AI 032	Un-shielded, feet glued	S-Hybrid replacement	2024-5-232	07/07/05		Perugia
Outer						
L10 AO 149	Hybrid assembled	S-Hybrid replacement	2024-6-049	15/07/05		Travel GVA-PG
L10 AO 151	Hybrid assembled	K-Hybrid replacement S-Hybrid replacement	2025-5-288 2024-5-280	14/07/05 18/07/05		Geneve
L11 AO 153	Hybrid assembled	RCAMS 10 replacement VA and RCAMS replacement		27/05/05 08/07/05	yes Low saw RCAMS 10	Travel GVA-PG
L14 AO 123	Hybrid assembled	RCAMS 15 replacement		31/05/05	yes Good	Geneve
L14 AO 125	Feet glued	VA 13 replacement		15/06/05	yes Good	Travel PG-GVA
L14 AO 156	Hybrid assembled	S-Hybrid replacement	2024-5-194	11/07/05		Travel GVA-PG
L15 AO 163	Hybrid assembled	S-Hybrid replacement	2024-5-222	11/07/05		Travel GVA-PG
L15 SO 178	Hybrid assembled	under tests				Perugia

Successful reparations : 6

Unknown : 9

Under tests : 1

TOT 16

Reparation work in Geneva has been completed and repaired ladders have been shipped to Perugia for bonding.



Spare material in Geneva:

- **VA** 76 pcs

- **RCAMS**

batch 01004 (AMS02/mask AMS01) :

71 pcs received june 2004

23 pcs received sept. 2001

standard AMS02 design :

9 pcs (4 good + 5 to be tested)

129 pcs (likely bad, to be tested)

- **SILICON** 3 wafers

c223_11

c150_4

c157_12



Layers integration summary:

- ***Fully integrated layers : 4 (L2, L4, L5, L7)***

All successfully tested.

***Need to reinforce airex gluing on ladders
installed on layers L2, L4 and L5.***

- ***Layers ready to be equipped with ladders: 4 (L1, L3, L6, L8)***

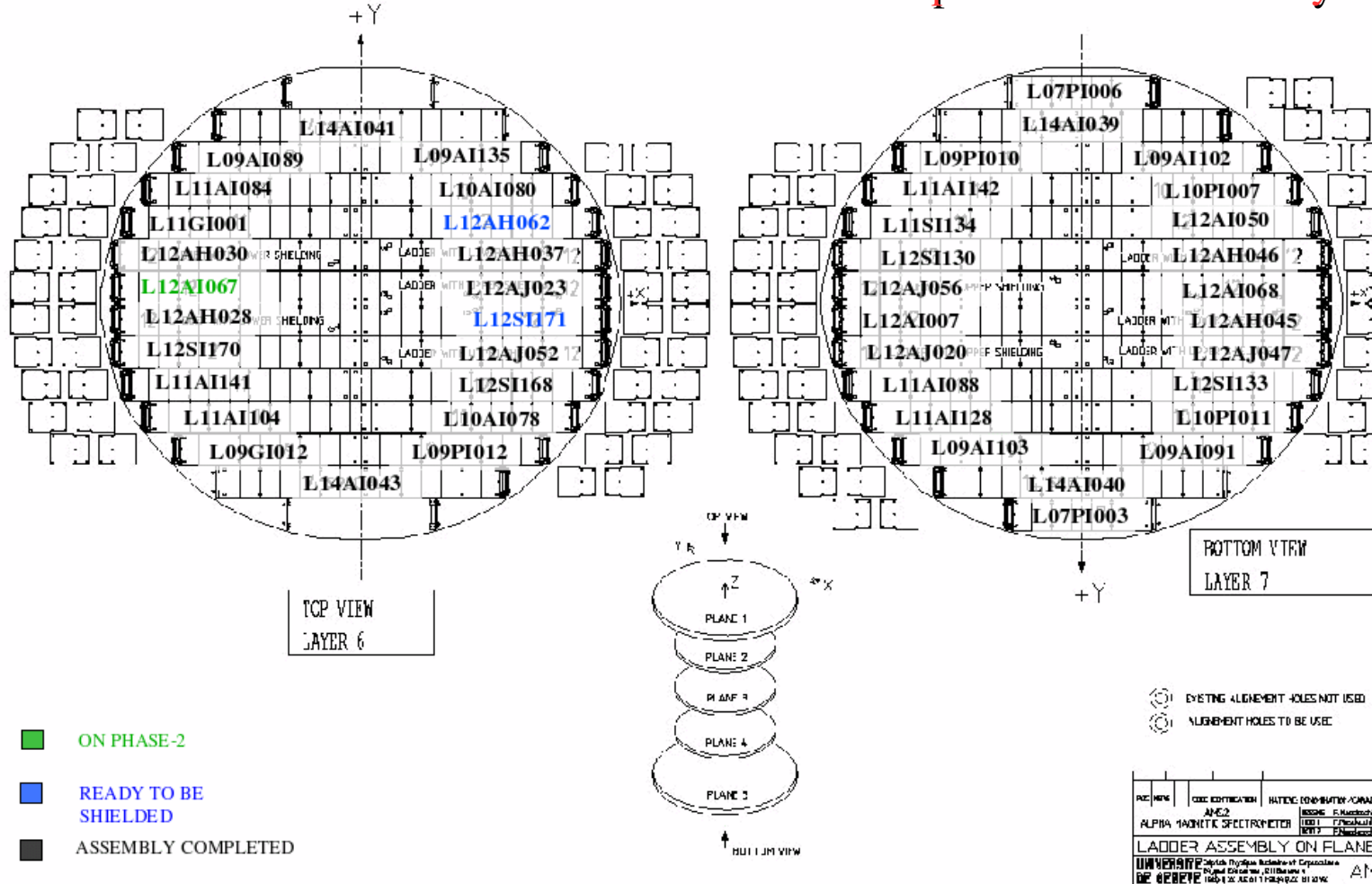
*Thermal bars have been mounted on the two Outer planes .
Ladders installation will restart beginning of next week.*

AMS-02 Tracker - Plane 4

July 19, 2005

L6 installation starting next week

L7 completed and successfully tested





Plane 4 summary :

- ***Layer L7 :***
completed and successfully tested
- ***Layer L6 :***

Ladders summary:

16/22 ready to be installed

2/22 completely assembled, to be tested after shielding wrapping

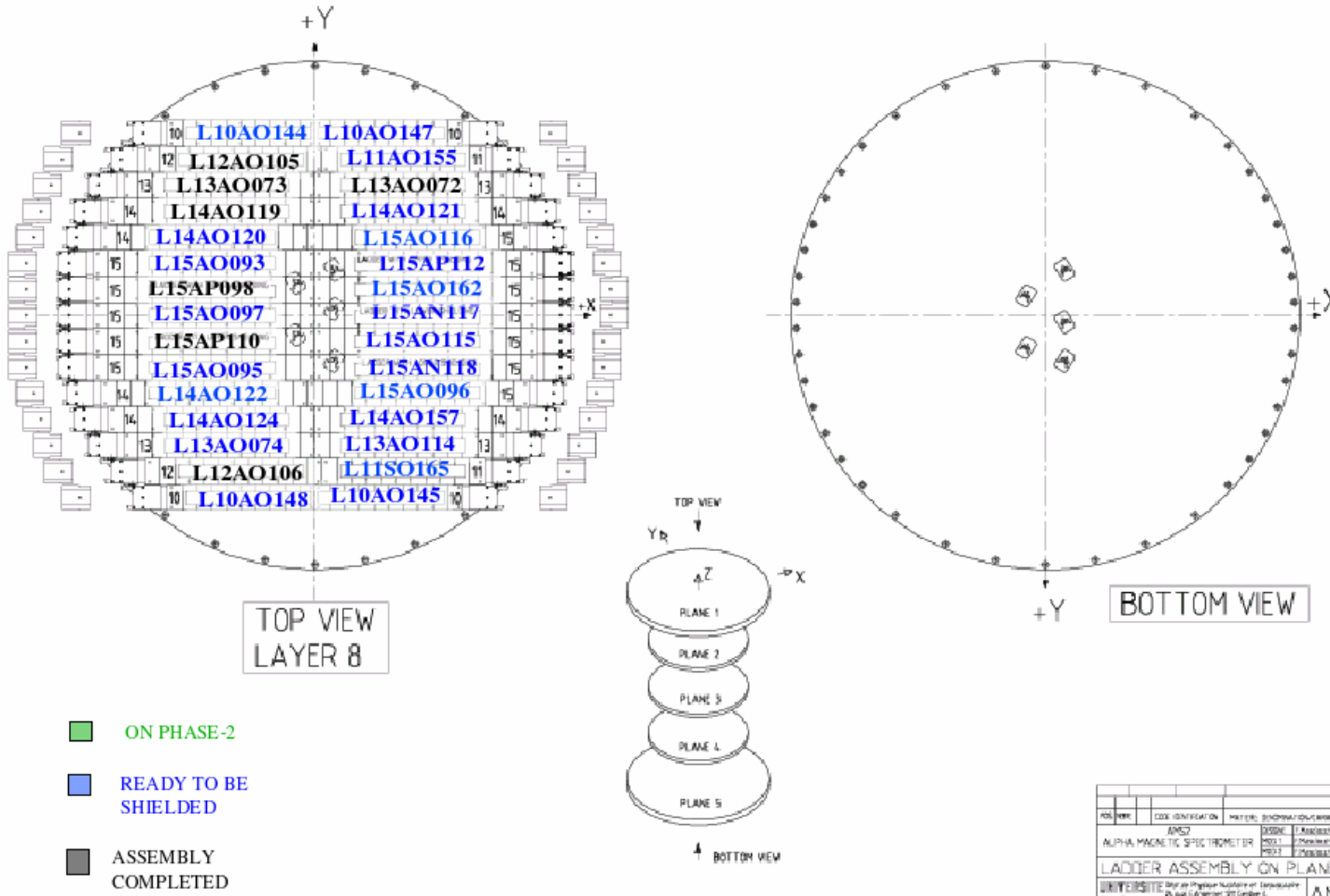
2/22 to be tested after legs gluing

1/22 hybrids box installed, legs to be glued

Ladders installation is foreseen by beginning of next week

AMS-02 Tracker - Plane 5

July 19, 2005



PROJ	AMS02	CODE IDENTIFICATION	DATE	2005/07/19
PROJ	AMS02	DESCRIPTION	ALPHA MAGNETIC SPECTROMETER	2005/07/19
PROJ	AMS02	DESCRIPTION	LADDER ASSEMBLY ON PLANE 5	2005/07/19
UNIVERSITE	UNIVERSITE DE GENÈVE			AMS1166A1



Plane 5 (Layer L8) summary :

•Ladders summary:

All needed ladders are in Geneva:

7/30 completely assembled:

***need to open hybrids box to insulate light-tight airex
and then to glue external airex with hybrids box***

23/30 legs glued, to be shielded:

1/23 has to be tested after legs gluing,

7/23 need to open hybrids box to insulate light-tight airex:

4/7 have external airex already glued on hybrids box!

15/23 are ready to be shielded

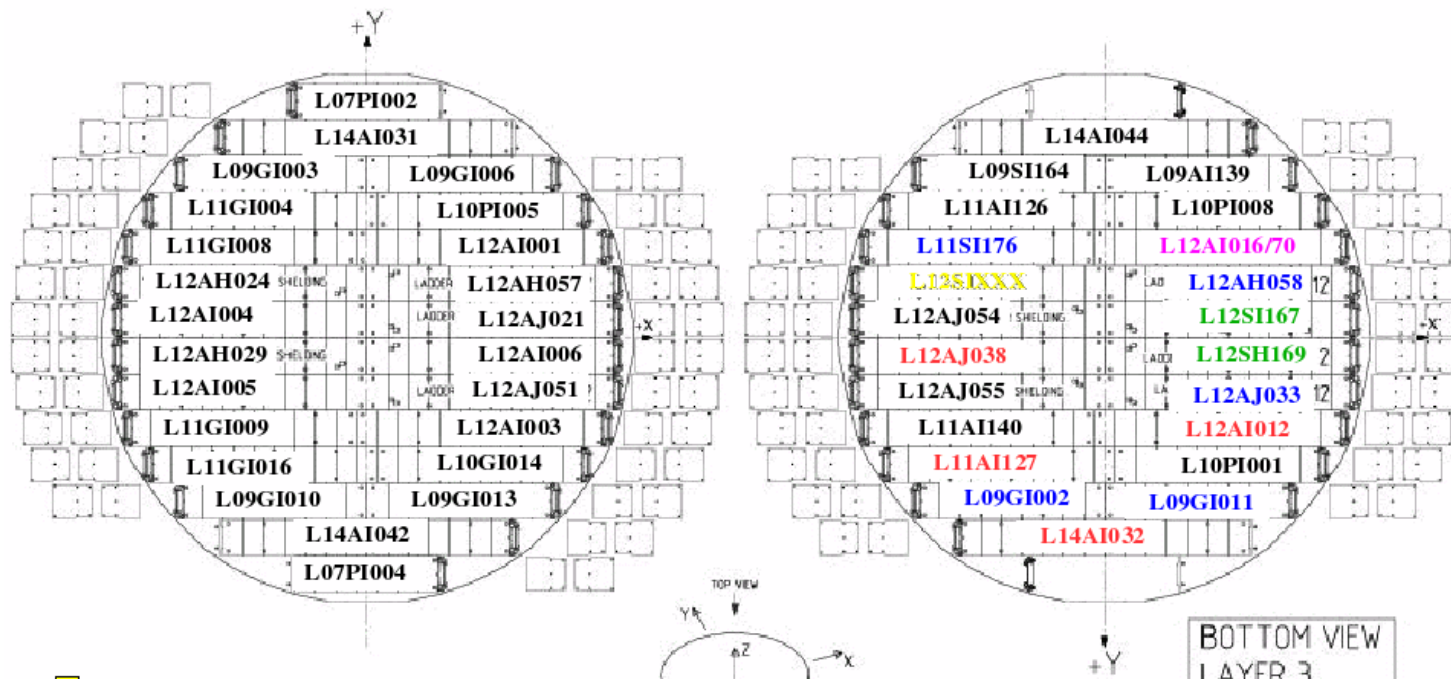
•Thermal bars have been mounted on plane

•Ladders installation is foreseen by September



AMS-02 Tracker - Plane 2

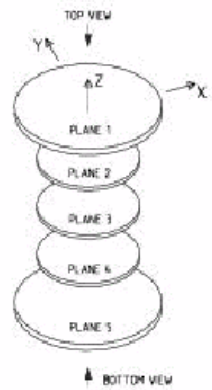
July 19, 2005



- ON PRODUCTION
- STAND BY
- ON REPARATION
- ON PHASE-2
- READY TO BE SHIELDED
- ASSEMBLY COMPLETED

TOP VIEW LAYER 2

BOTTOM VIEW LAYER 3



- Ⓢ EXISTING ALIGNMENT HOLES NOT USED
- Ⓢ ALIGNMENT HOLES TO BE USED

NO.	REV.	DESCRIPTION	DATE	BY	CHK.
1		AMS2			
ALPHA MAGNETIC SPECTROMETER					
LADDER ASSEMBLY ON PLANE 2					
AMS1162A1					



Plane 2 summary :

•Layer L2:

completed and successfully tested

need to reinforce external airex gluing on all ladders

•Layer L3 :

Ladders summary:

16/22 are in Geneva:

9/16 completely assembled:

3/9 has to be tested after shielding wrapping

6/9 are ready to be installed

5/16 legs glued, to be shielded:

1/5 is being tested with cosmic rays (L12AH058)

4/5 are ready to be shielded

1/16 is on phase-2

1/16 is in stand-by (see next slide)

1/22 is in travel from Perugia to Geneva (after reparation and bonding)

1/22 is in production (1 L12I)



Layer L3 - Stand-by ladder on L12I position

The choice is between:

L12AI016 marginal ladder accepted at last Tracker meeting (12/05/2005)

87 bad channels (45 on S-side + 42 on K-side)

Average number of clusters: S-side 12.5 – K-side 11.2

Assembly status: hybrids assembled

and:

L12AI070 marginal ladder, rejected

80 bad channels (49 on S-side + 31 on K-side)

Average number of clusters: S-side 9.3 – K-side 10.9

Assembly completed

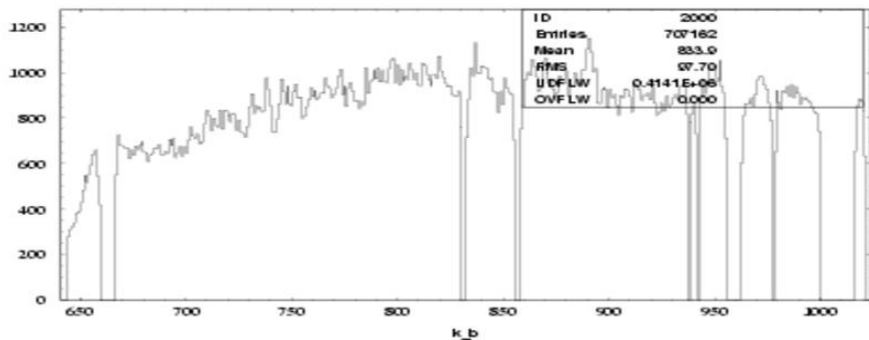
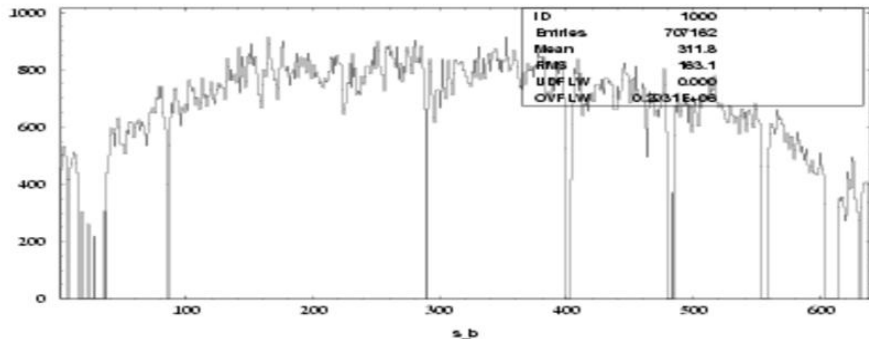
See next slides for tests summary plots.



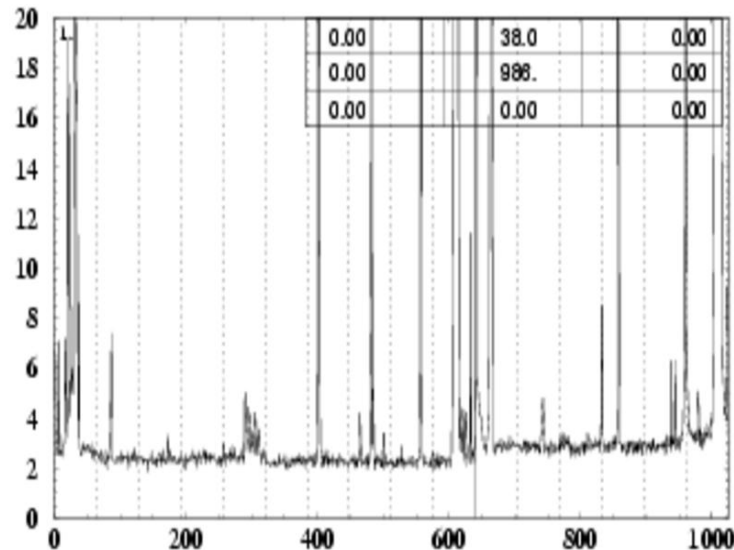
L12AI016:

- **87 bad channels**
(45 on S-side + 42 on K-side)
- **Average number of clusters**
S-side 12.5 – K-side 11.2

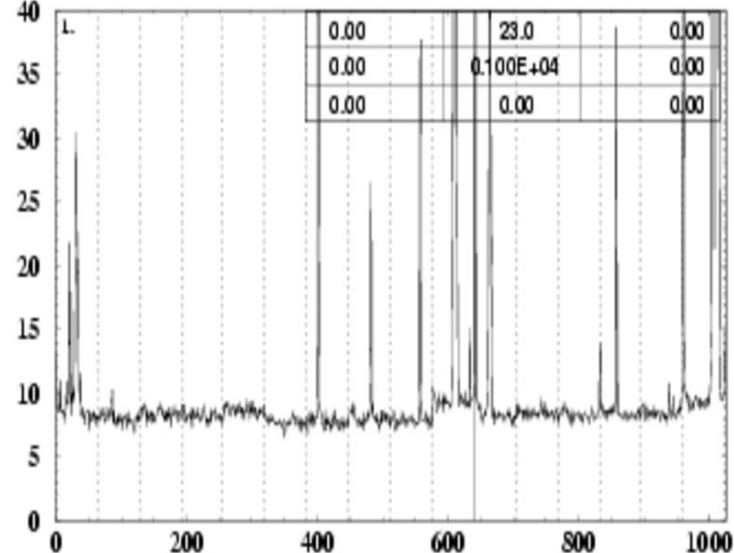
Source Test



sigmas



sraw

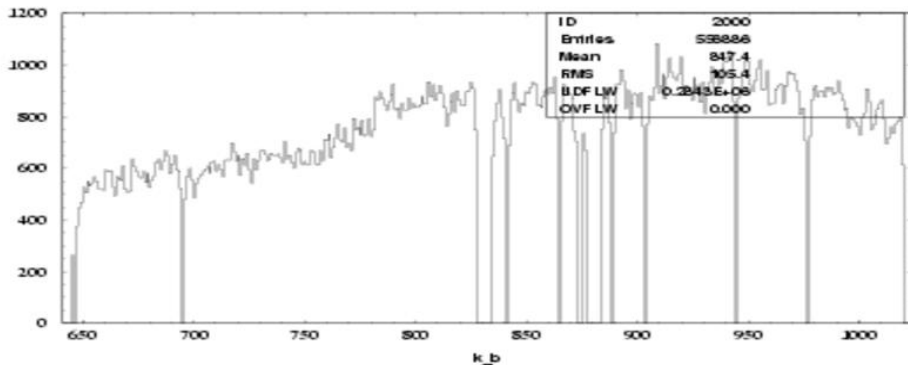
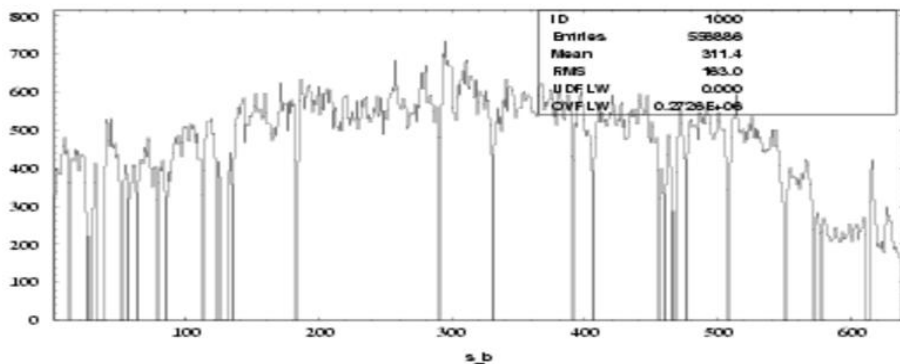




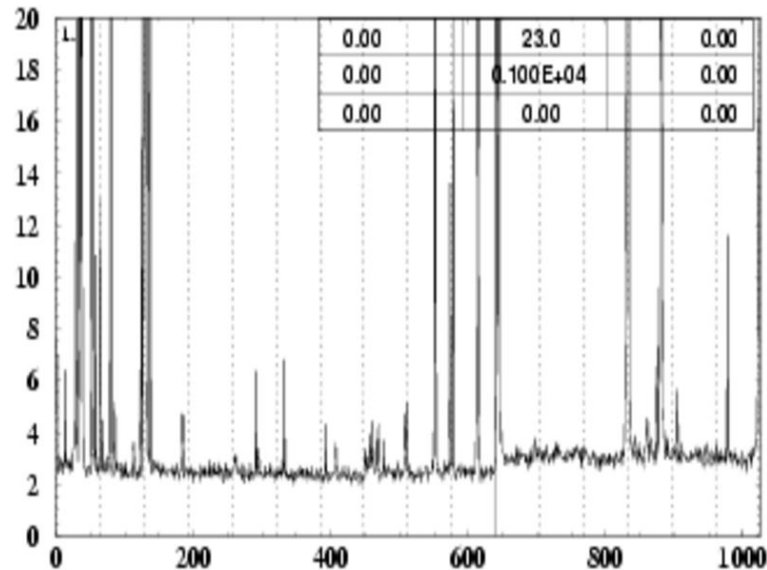
L12AI070:

- **80 bad channels**
(49 on S-side + 31 on K-side)
- **Average number of clusters**
S-side 9.3 – K-side 10.9

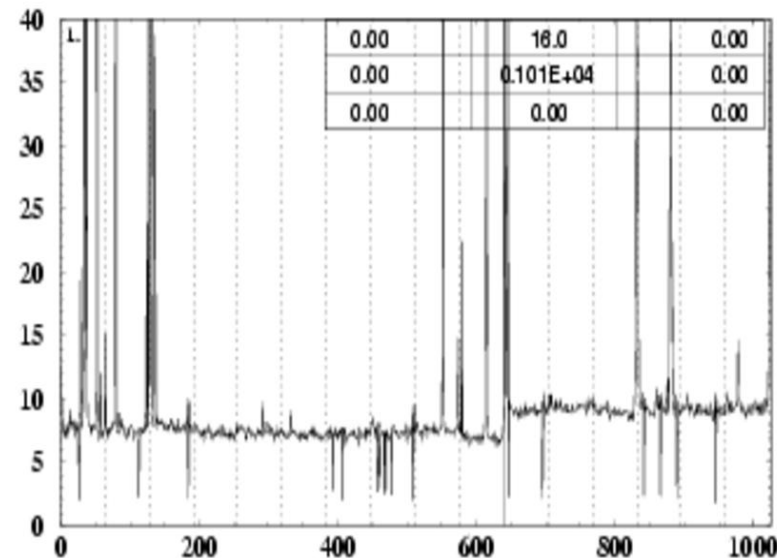
Source Test



sigmas

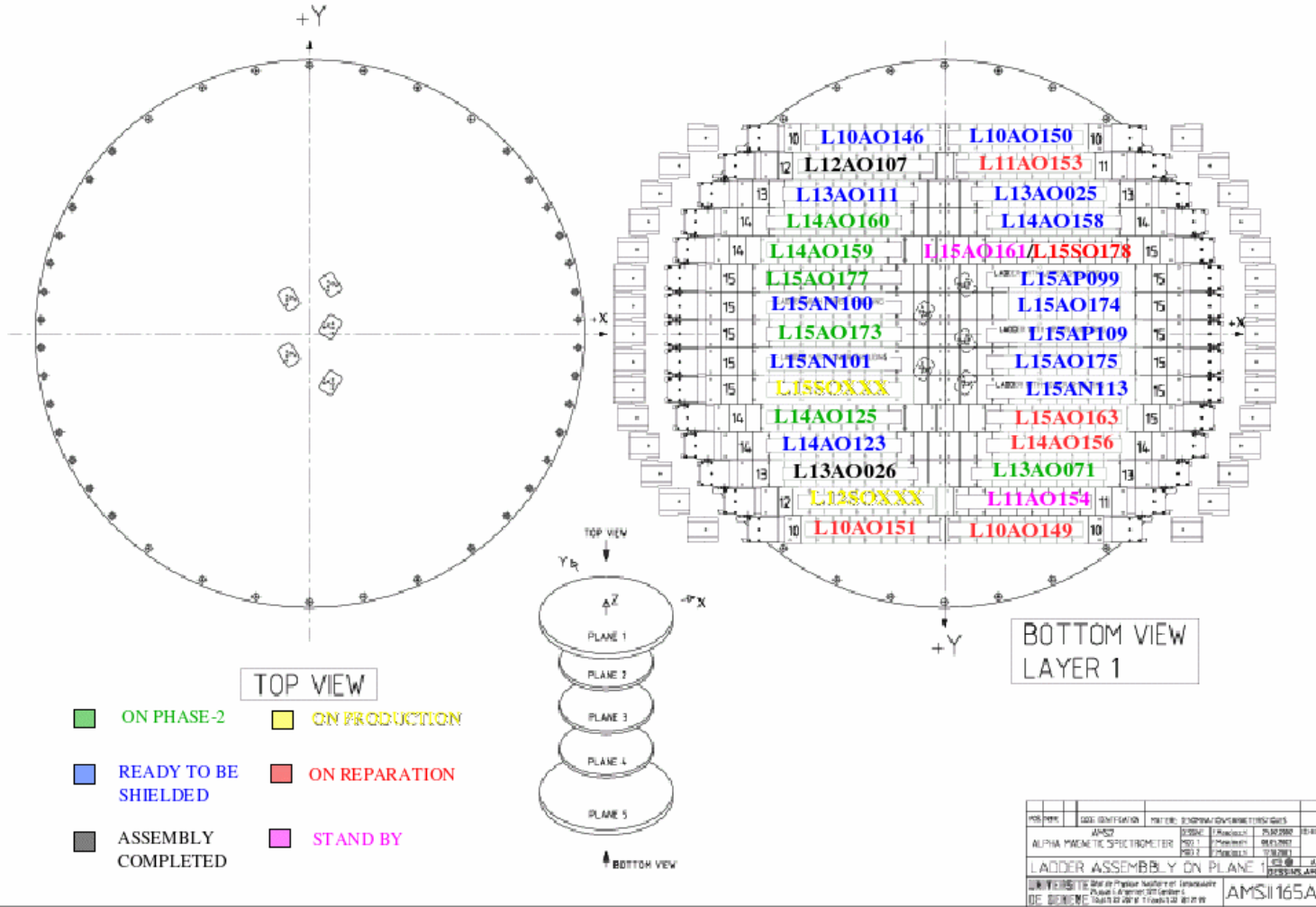


sraw



AMS-02 Tracker - Plane 1

July 19, 2005





Plane 1 (Layer L1) summary :

- ***Thermal bars have been mounted on plane***

- ***Ladders summary:***

22/30 are in Geneva:

2/22 completely assembled {1 / 2 needs metrology (L13AO026)}:

***need to open hybrids box to insulate light-tight airex
and then to glue external airex with hybrids box***

14/22 legs glued, to be shielded:

5/14 has to be tested after legs gluing,

***5/14 need to open hybrids box to insulate light-tight airex:
2/5 have external airex already glued on hybrids box!***

4/14 are ready to be shielded { 1/4 needs metrology (L13AO025)}

3/22 are on phase-2

1/22 has been repaired and has to be shipped to Perugia for bonding

2/22 are in stand-by

4/30 are in travel from Geneva to Perugia (repaired to be bonded)

1/30 is in travel from Perugia to Geneva (after reparation and bonding)

1/30 is in Perugia waiting for metrology (L15AO177)

1/30 is in Perugia under tests (L15SO178)

2/30 are in production (1 L120 + 1 L150)



Layer L1 - Stand-by ladders on L110 position:

L11A0154 *marginal ladder*

80 bad channels (44 on S-side + 36 on K-side)

K-side hole 24 channels wide

Problem likely due to silicon

Assembly status: hybrids assembled

No spare ladder foreseen: we have to use this one!

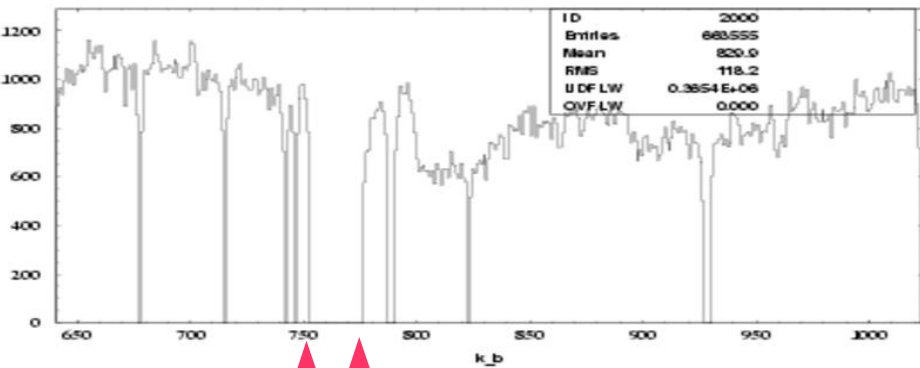
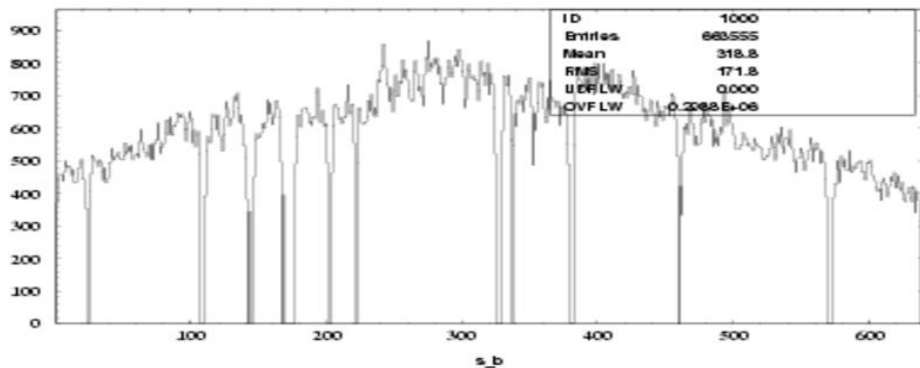
See next slides for tests summary plots.



L11A0154:

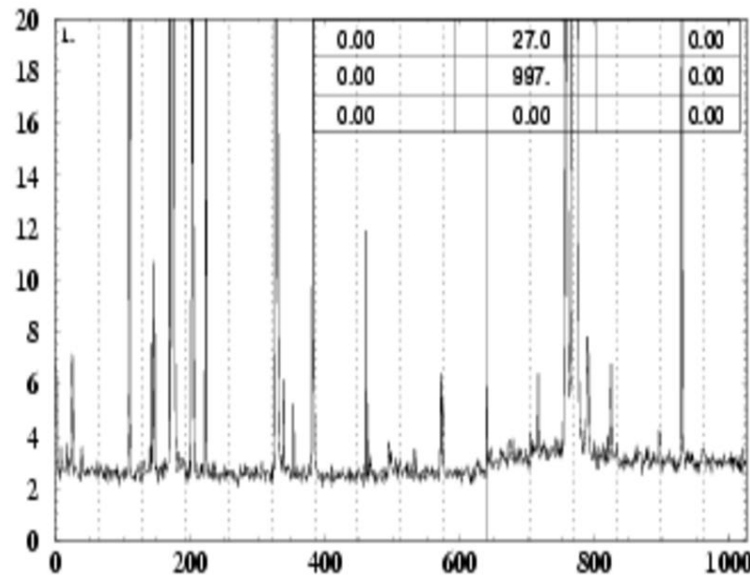
- **80 bad channels**
(44 on S-side + 36 on K-side)
- **K-side hole 24 channels wide**
- **Problem likely due to silicon**

Source Test

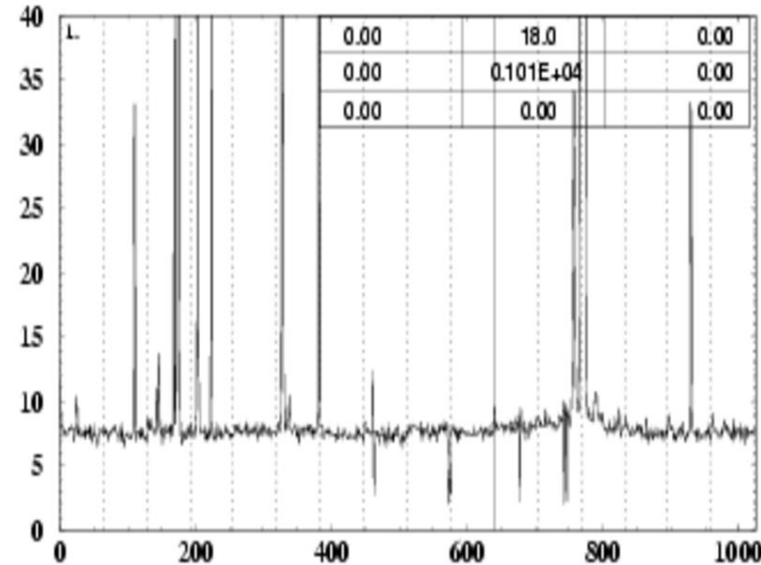


Mercedes Paniccia

sigmas



sraw



University of Geneva



Layer L1 - Stand-by ladders on L150 position:

L15A0161 *marginal ladder*

95 bad channels (60 on S-side + 35 on K-side)

S-side hole 26 channels wide

K-side hole 20 channels wide

Problem likely due to silicon

Assembly status: hybrids assembled

See next slides for tests summary plots.

We could replace it with:

L15S0178 *in Perugia under tests*

wafer 13 cracked

after disconnecting wafers 14 and 15 the total current

has lowered from 47.8 uA to 20 uA

Assembly status: hybrids assembled

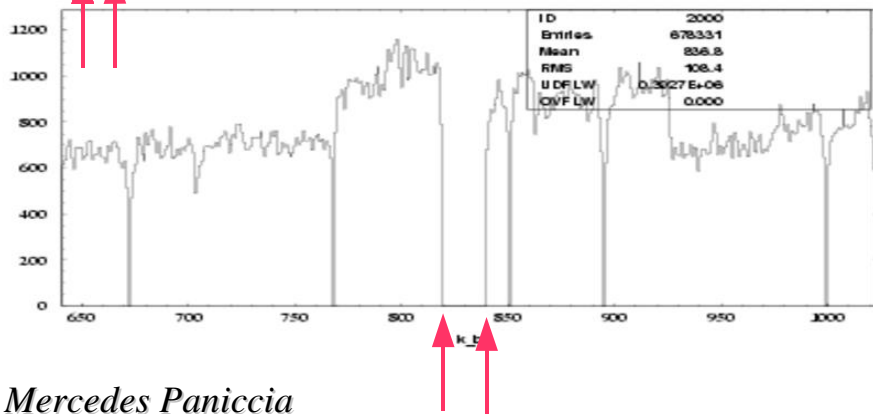
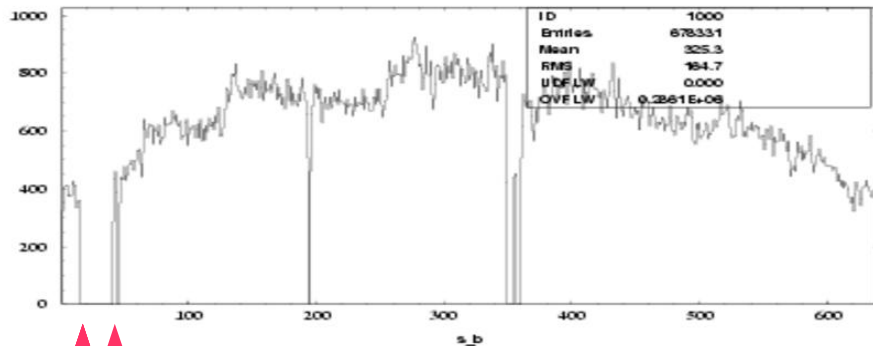
if we manage to repair it successfully.



L15A0161:

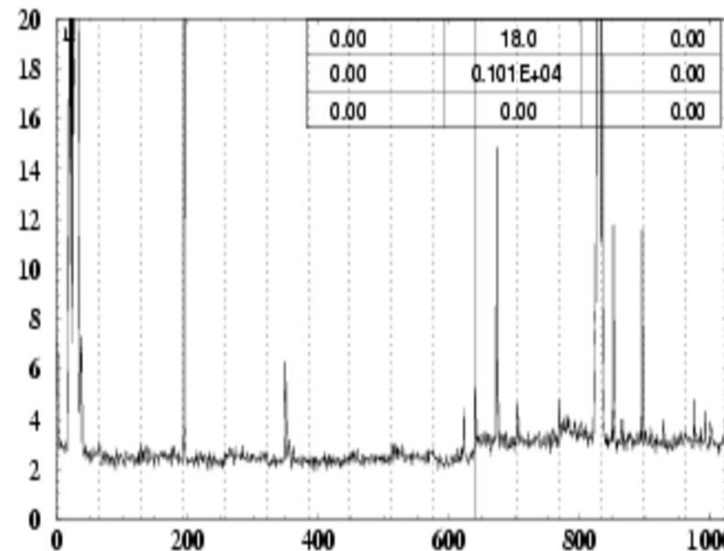
- **95 bad channels**
(60 on S-side + 35 on K-side)
- **S-side hole 26 channels wide**
- **K-side hole 20 channels wide**
- **Problem likely due to silicon**

Source Test

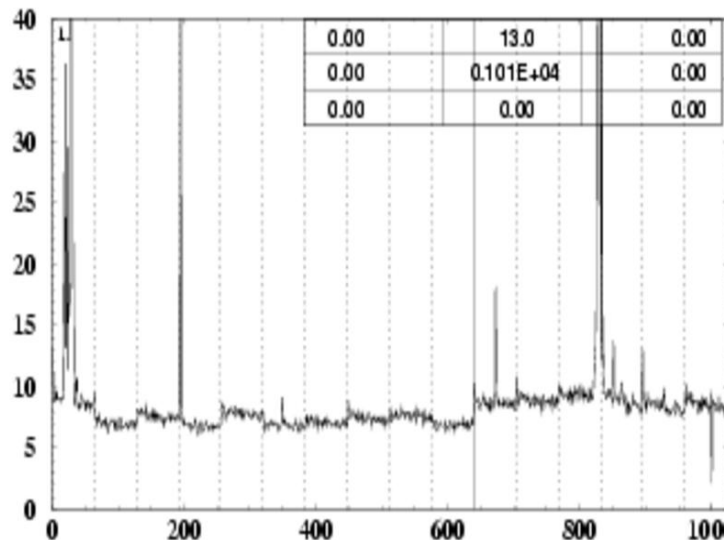


Mercedes Paniccia

sigmas



sraw



University of Geneva



Planning

- **Reparation of L15S0178: August**
- **End of phase-2 for all ladders: beginning of September**
- **Plane 4 completed:**
 - all ladders installed on L6 : end of August*
 - tests on L6 completed: beginning of September*
- **Plane 5 integration + tests : mid September -> end of October**
 - (shielding on ladders for L8 should be done in parallel with integration)*
- **Layer L3 integration : not earlier than November**
- **Plane 1 integration : not earlier than December**
 - (shielding on ladders for L1 should be done in parallel with integration)*