Integration Status at UNIGE

Mercedes Paniccia *University of Geneva*

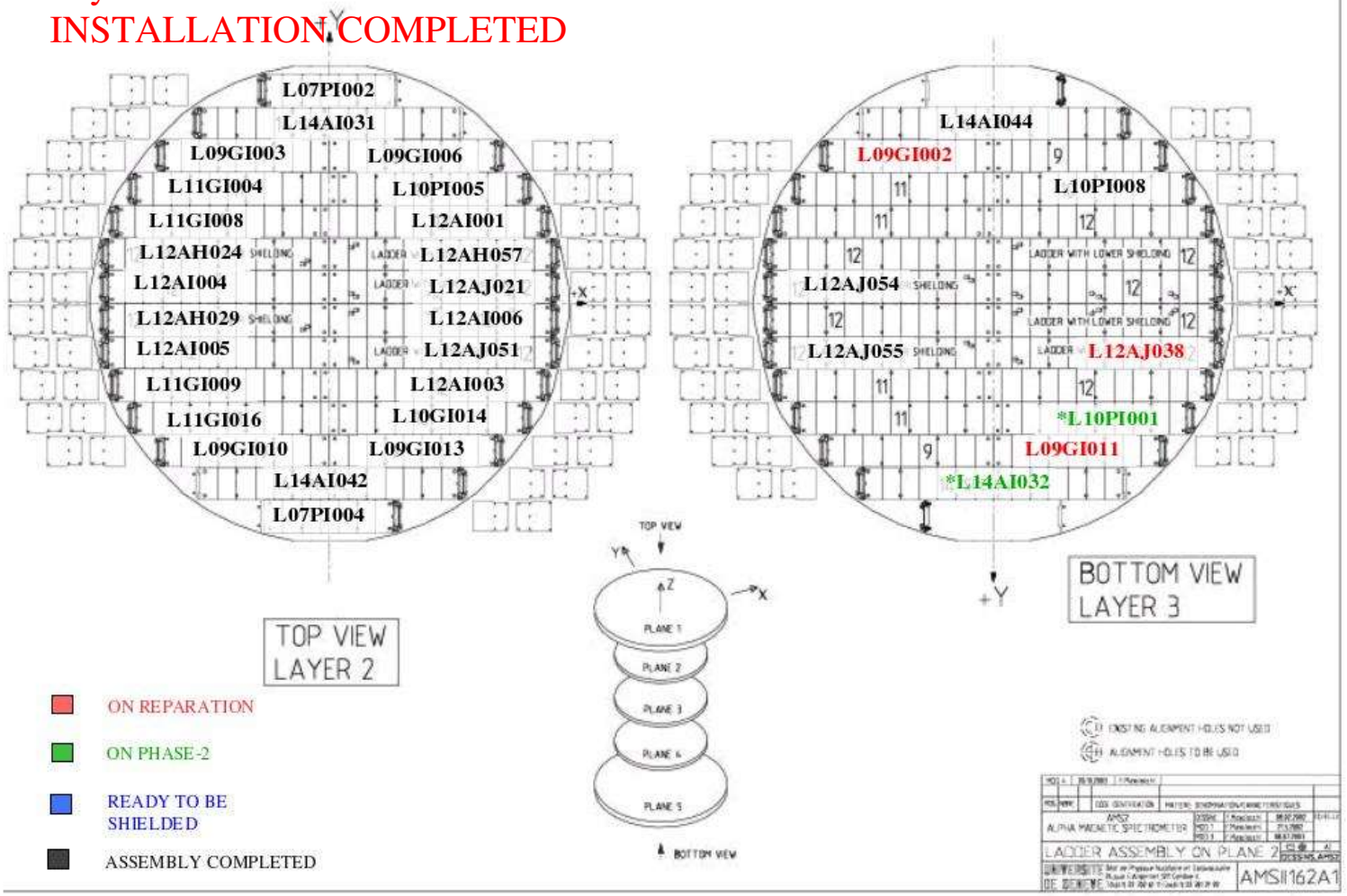
Ladders installed on planes (86/163) :

ON LAYER L1	ON LAYER L2	ON LAYER L3	ON LAYER L4	ON LAYER L5	ON LAYER L6	ON LAYER L7	ON LAYER L8
	L07PI002		L09GI005	L09AI090 (140μm)			
	L07PI004		L09AI075 (70μm)	L09AI092 (140μm)		L07PI006 (140μm)	
	L09GI003		L09AI076 (70μm)	L09AI136 (140μm)		L09AI091 (140μm)	
	L09GI006		L09AI077 (70μm)	L09AI138 (140μm)		L09PI010 (140μm)	
	L09GI010		L10GI015	L10PI009 (140μm)		L09AI102 (140μm)	
	L09GI013		L10AI079	L10PI013 (140μm)		L09AI103 (140μm)	
	L10PI005		L11GI017	L11AI085 (140μm)		L10PI007 (140μm)	
	L10GI014		L11AI081 (70μm)	L11AI086 (140μm)		L10PI011 (140μm)	
	L11GI004		L11AI082 (140μm)	L11AI087 (140μm)		L11AI088 (140μm)	
	L11GI008		L11AI083 (140μm)	L11AI143 (140μm)		L11AI128 (140μm)	
	L11GI009		L12AH059 (70μm)	L12AH035 (140μm)		L11AI142 (140μm)	
	L11GI016		L12AH060	L12AH036 (140μm)		L11SI134 (140μm)	
	L12AH024		L12AH061	L12AI017 (140μm)		L12AH045 (70μm)	
	L12AH029		L12AI015	L12AI049 (140μm)		L12AH046 (70μm)	
	L12AH057		L12AI048	L12AI066			
	L12AI001		L12AI063	L12SI131 (140μm)		L12AI050 (140μm)	
	L12AI003		L12AI064	L12SI132 (140μm)		L12AI068	
	L12AI004		L12AI065	L12AJ022		L12SI130 (140μm)	
	L12AI005		L12AJ018	L12AJ034 (140μm)		L12SI133 (140μm)	
	L12AI006		L12AJ019	L12AJ053		L12AJ020	
	L12AJ051					L12AJ047	
	L12AJ021					L12AJ056	
	L14AI031					L14AI039 (140μm)	
	L14AI042					L14AI040 (140μm)	
0/30	24/24	0/22	20/20	20/20	0/22	22/24	0/30

AMS-02 Tracker - Plane 2

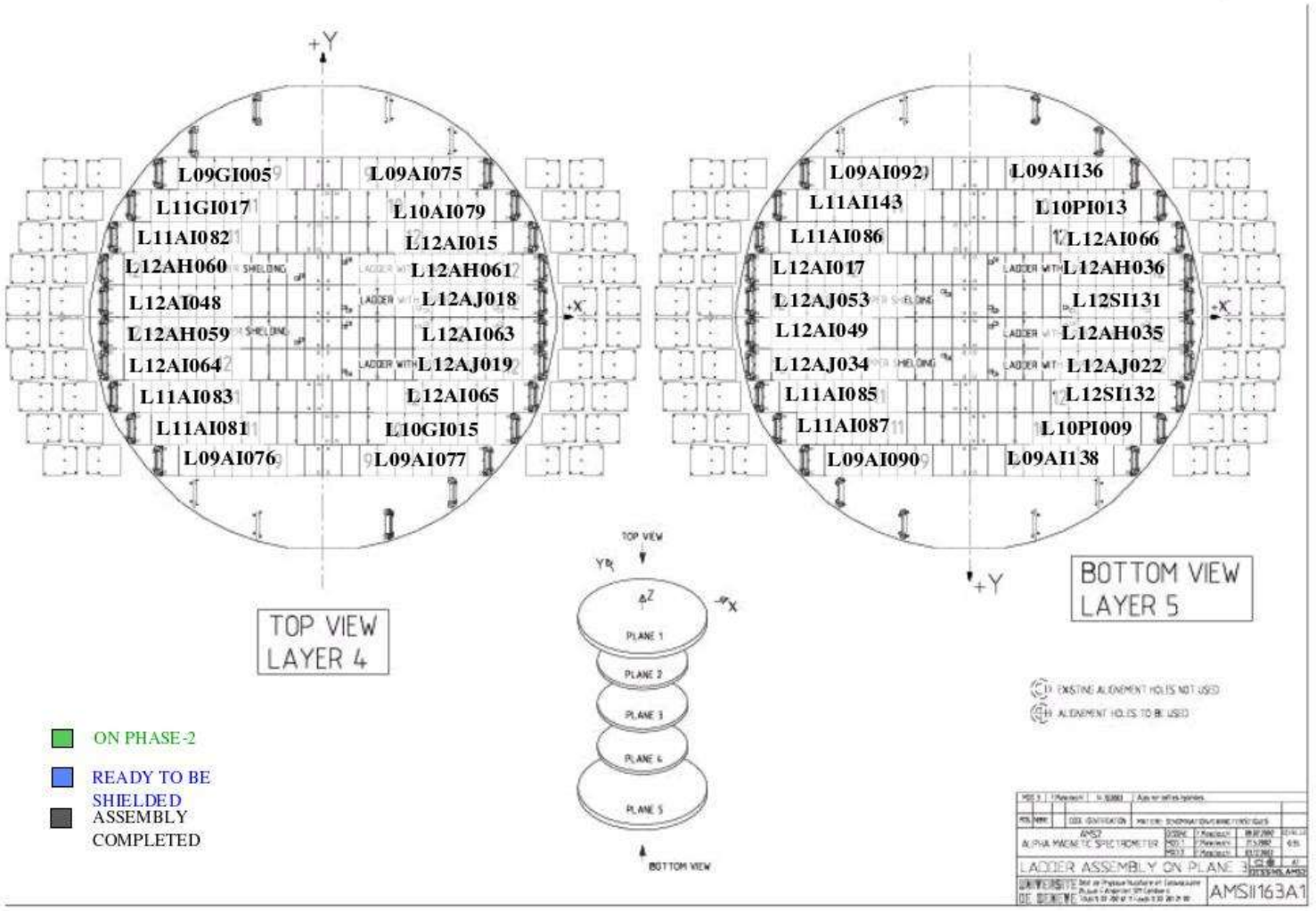
February 7, 2005

Layer 2:
INSTALLATION COMPLETED



AMS-02 Tracker - Plane 3 INSTALLATION COMPLETED

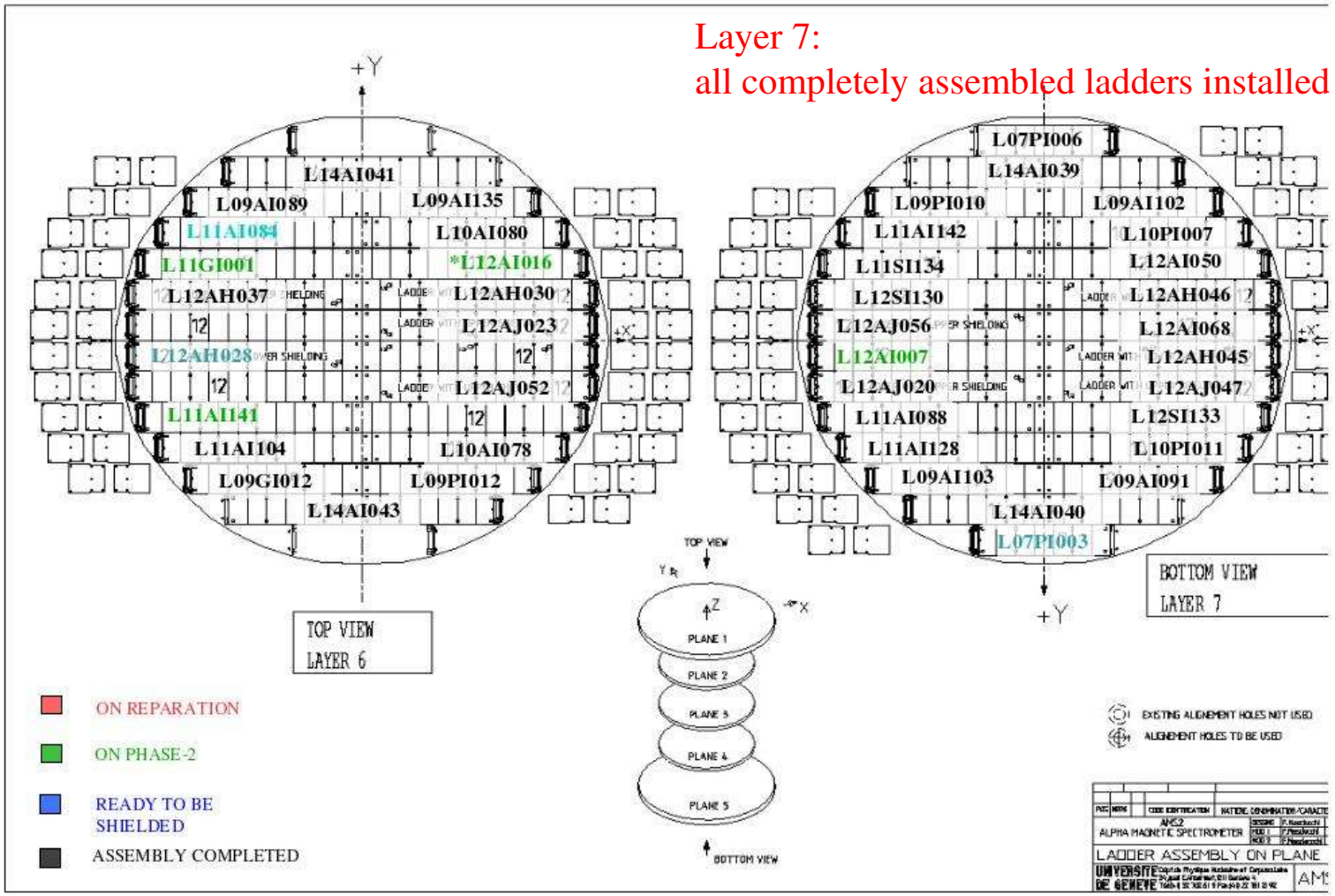
October 14, 2004

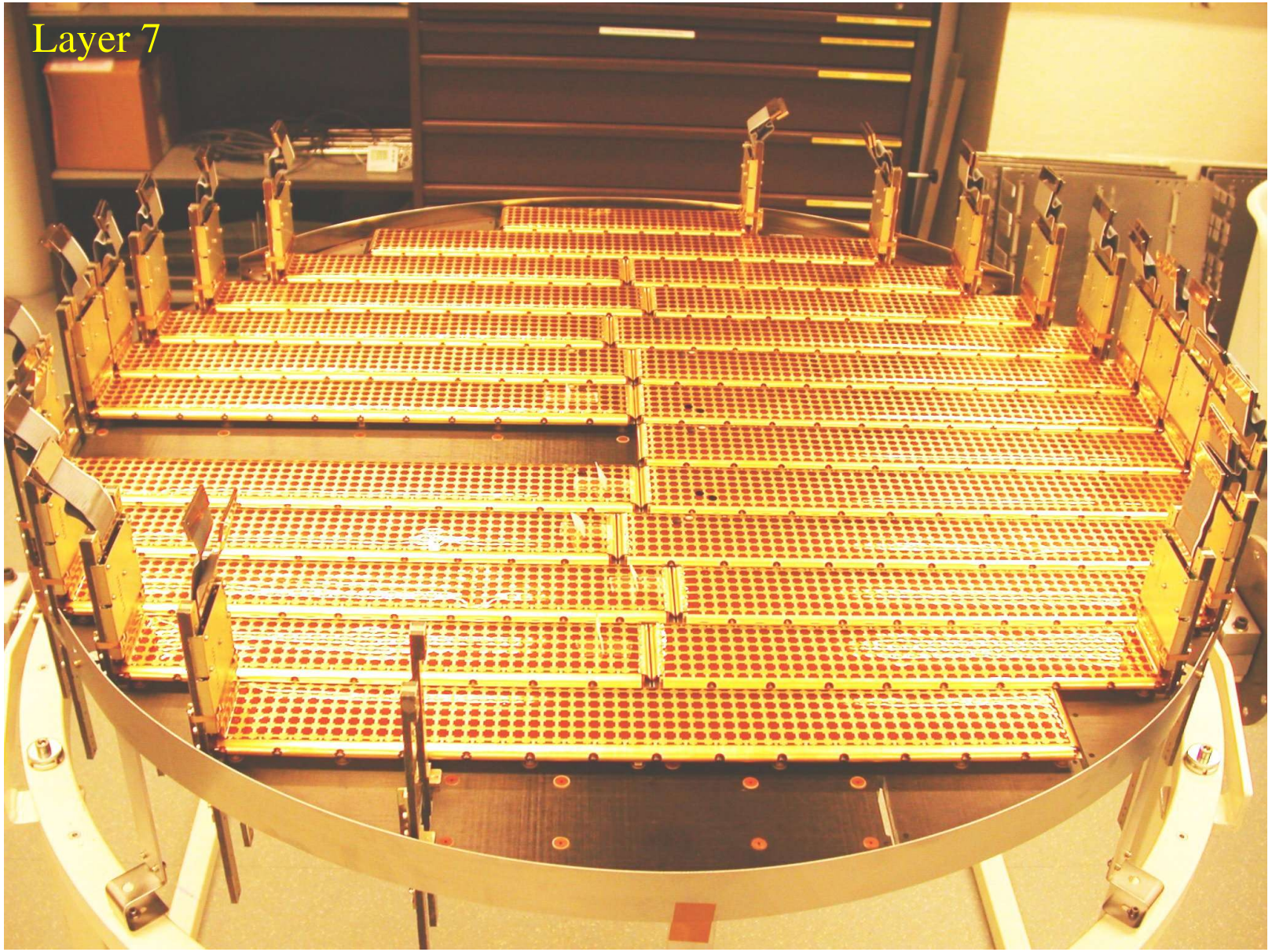


Plane 4 being stored

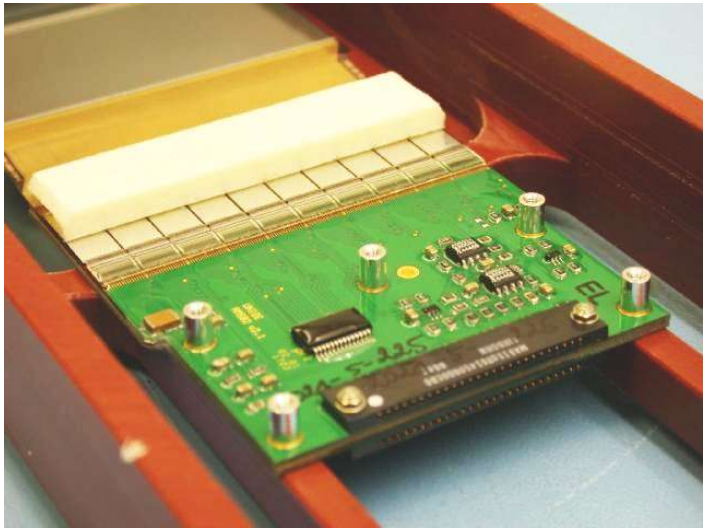
AMS-02 Tracker - Plane 4

February 3, 2004




Layer 7

Problem during L7 installation: S side airex unglued on L09AI091

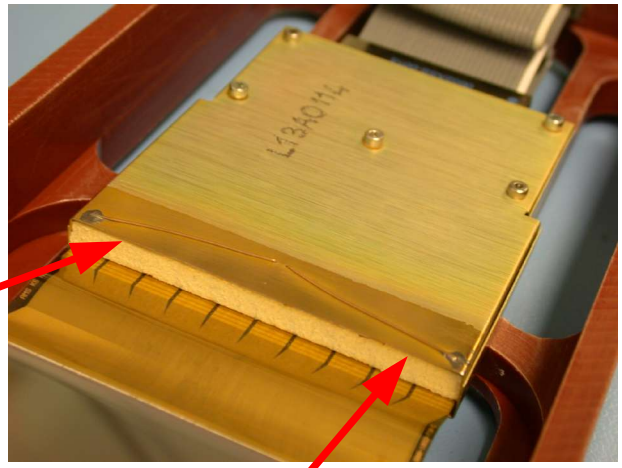


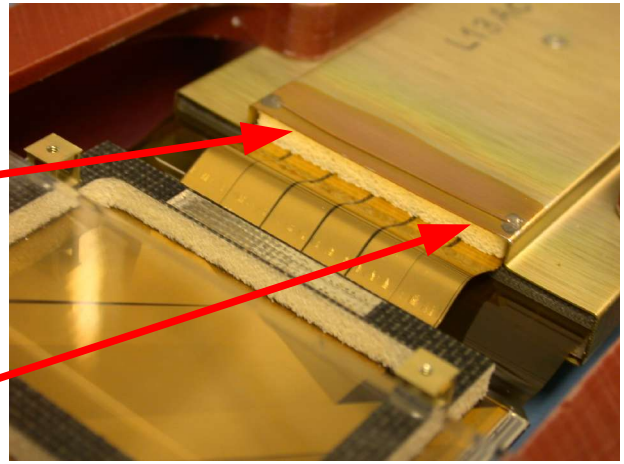
Fixing: add redundant airex gluing points on both sides (S&K) for all ladders

Ladders not yet installed on planes:

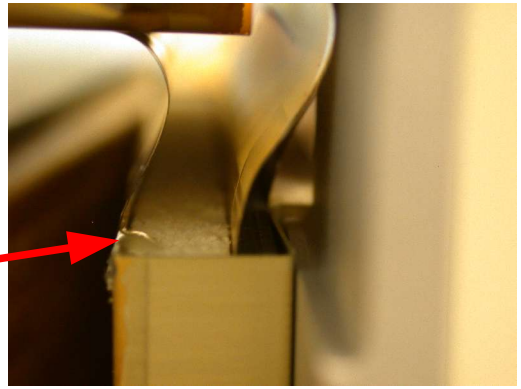
add two gluing points between S/K airex and hybrids cover/box

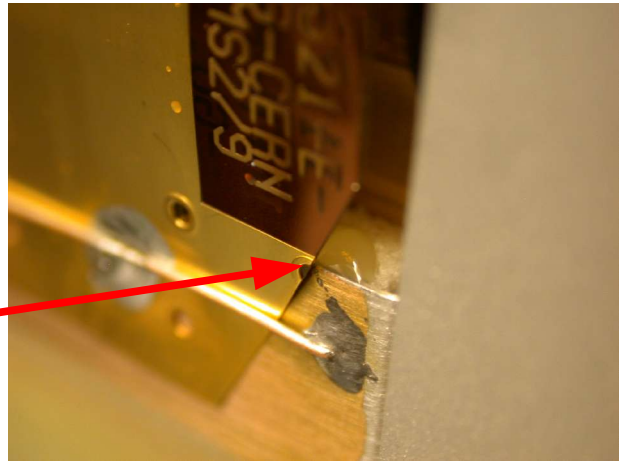
ladders after phase-2:





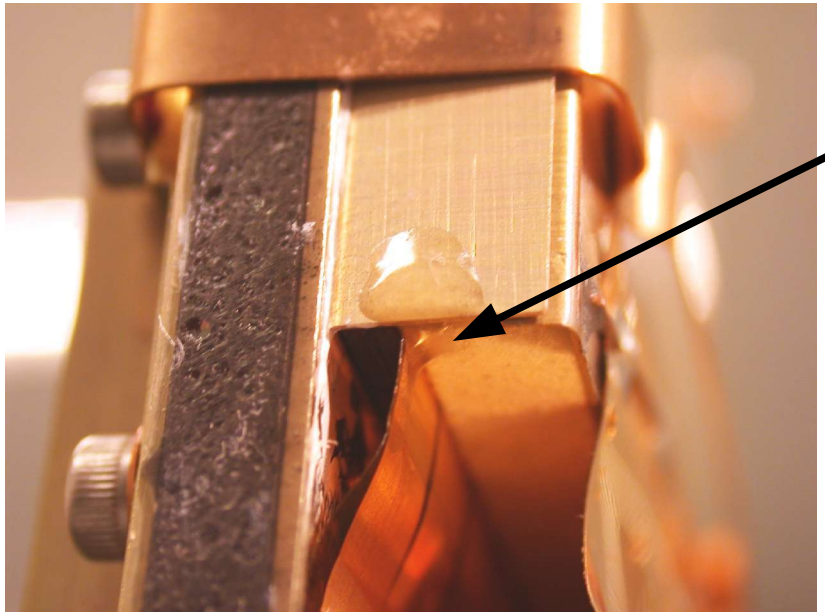
ladders after shielding:





Ladders already installed on planes:

add two gluing points between airex and kapton



tricky on K side: airex not visible!

All ladders installed on L7 have been cured

Plane 3 and Layer L2 have to be treated

Ladders in the production chain (77/163) :

SHIELDED		TO BE SHIELDED	ON PHASE-2	ON REPARATION	REJECTED
L09AI089 (L6) (140μm)		L13AO114 (140μm)	L07PI003 (L7) (S)	L09GI002 (L8) (S) (Hs)	
L09AI135 (L6) (140μm)		L13AO111 (140μm)	L12AH028 (L6) (S)	L09GI011 (L8) (S) (Hs)	
L09GI012 (L6) (140μm)		L14AO126 (140μm)	L11AI084 (L6) (140μm)	L12AI012 (140μm) (CAPA 16)	
L09PI012 (L6) (140μm)		L14AO121 (140μm)	L11AI141 (L6)	L12AJ038 (L8) (Hs) (TW)	L11GI007 (E) (vib.) (Hs,k)
L10AI078 (L6) (70μm)	L12AO105 (140μm)	L14AO124 (140μm)	L11GI001 (L6)		L12AI002 (S2,3)
L10AI080 (L6) (140μm)	L12AO106 (140μm)	L14AO125 (140μm)	L12AI067 (L7)	L10AO149 (Hs)	L12AI009 (S7,8)
L10PI008 (L8) (140μm)	L12AO107 (140μm)	L15AN100 (140μm)		L10AO151 (Hs)	L12AI010 (Hk) (still probl.)
L11AI104 (L6) (140μm)	L13AO026 (M) (140μm)	L15AN101 (140μm)	L10AO144	L11AO153 (CAPA 10)	L12AI070 (140μm)(80 BChs)
L12AH030 (L6) (70μm)	L13AO072 (140μm)	L15AN113 (140μm)	L10AO147	L11AO154 (Hk)	
L12AH037 (L6) (140μm)	L13AO073 (140μm)	L15AN117 (140μm)	L10AO148	L14AO156 (Hs)	
L12AJ023 (L6) (70μm)	L14AO119 (140μm)	L15AN118 (140μm)	L11AO155		
L12AJ052 (L6) (140μm)	L15AP098 (140μm)	L15AO093 (140μm)	L10AO150 (c.c.)		
L14AI041 (L6)	L15AP110 (140μm)	L15AO097 (140μm)	L14AO157 (c.c.)		
L14AI043 (L6) (140μm)		L15AP099 (140μm)	L15AO096 (c.c.)		
L14AI044 (L8) (140μm)		L15AP109 (140μm)		9	
		L15AP112 (140μm)			
				STAND-BY	
				L12AI067	
				L15AO094 (S15)	
				L13AO025 (M) (62 BChs)	
				L13AO074 (c.c.) (50 BChs)	
				L14AO122 (17 Chs hole/41 Bchs)	
				L15AO116 (45 BChs)	
				L14AO123 (140μm) (Dead CHs on VA 15)	LEGENDA:
				L15AO095 (140μm) (Very high leak. curr.)	
		L12AJ054 (L8) (TW)			F: feet glued
		L12AJ055 (L8) (TW)			S: shielded
					M: metrology
					S: sensor prob.
					H: hybrid prob.
					K6: kapton misplaced
					TW: test Wallraff
					FChs: faible channels
					BChs: bad channels
					(c.c.): needs conf. coat.
24 (15 inner + 9 outer)		18 (16+2)	13 (10+3)	8	5 (1 x L11 + 4 x L12)

Ladders in Geneva : 163

- installed on planes : 86 (64 tested + 22 to be tested)
- ready to be installed : 24 (15 inner + 9 outer)
- on shielding phase : 18 (16 inner + 2 outer)
- on phase-2 : 13 (6 inner + 7 outer)
- to be repaired : 9 (4 inner + 5 outer)
- stand-by : 8 (1 inner + 7 outer)
- rejected : 5 (1xL11Inner + 4xL12Inner)

Ladders to be repaired (9/163) :

Weak gain hybrids: L09GI002 (Hs)
L09GI011 (Hs)

Hybrids capacitors damaged by cable failure at G&A:
L10AO149 (Hs)
L11AO153 (Hs-capacitor 10)
L14AO156 (Hs)

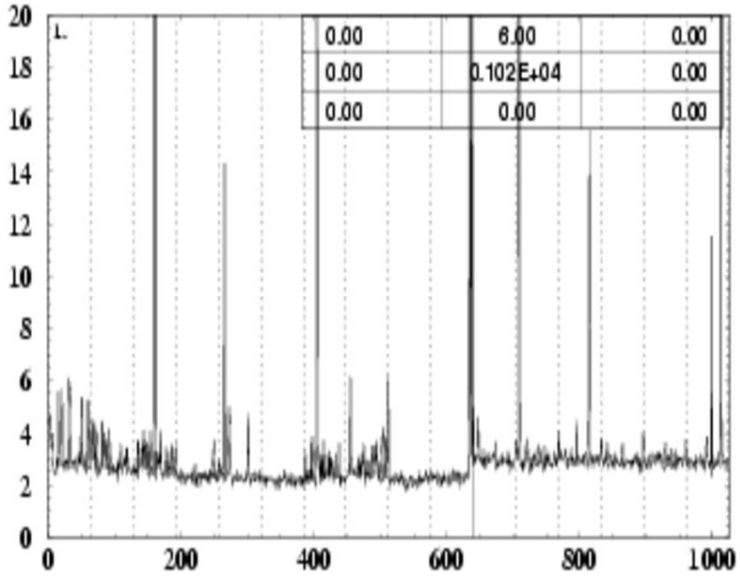
Hybrids capacitors damaged:
L10AO151 (Hs) *
L12AJ038 (Hs) *
L12AI012 (Hs-capacitor 16)

Bad hybrid : L11AO154 (Hk)

black: already shielded – blue: feet glued – green: before phase-2

Discovering hybrids capacitors damaged: an example L10AO151

sigmas



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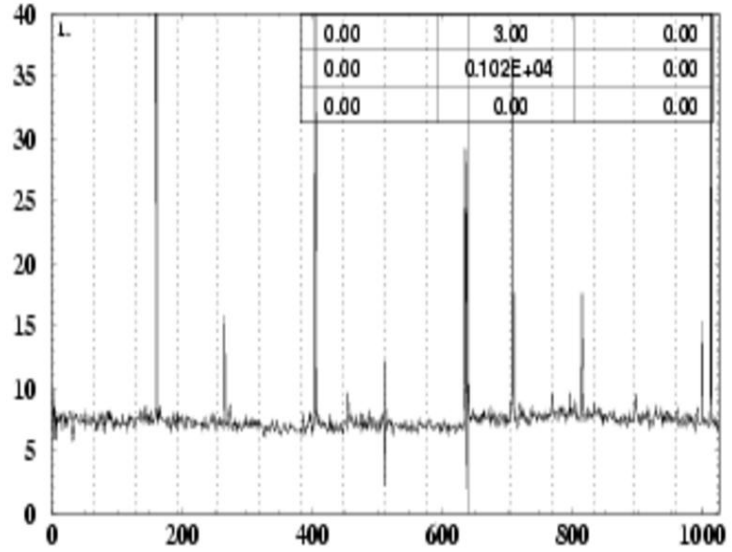
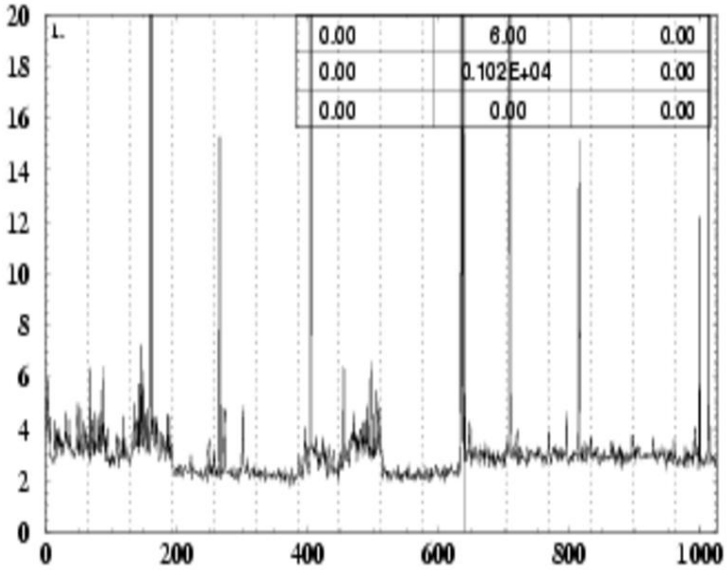


Guard-ring voltages: S-side= -2.0 V , K-side= +5.0V; Bias Voltage= 73 V (standard values used when testing ladders)

Similar behaviour on L10AO149, L11AO153, L14AO156 and L12AJ038

L10AO151 tested lowering S-side guard-ring voltage:

sigmas



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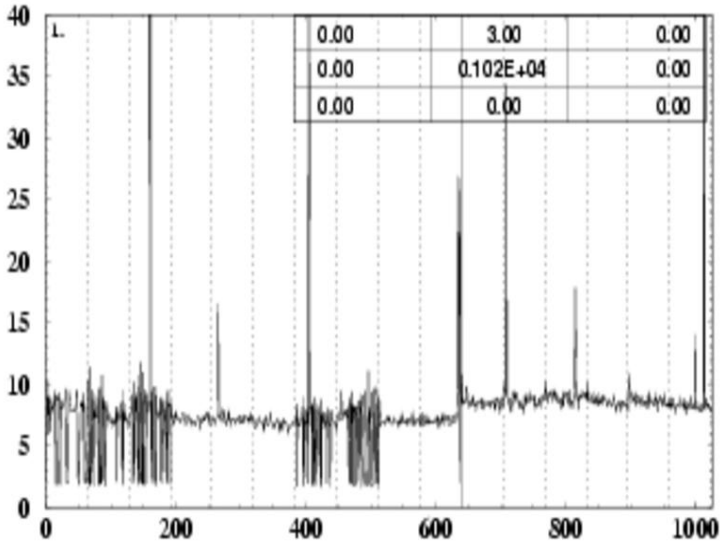


Guard-ring voltages: S-side= -5.3V , K-side= +5.0V; Bias Voltage= 70.1 V

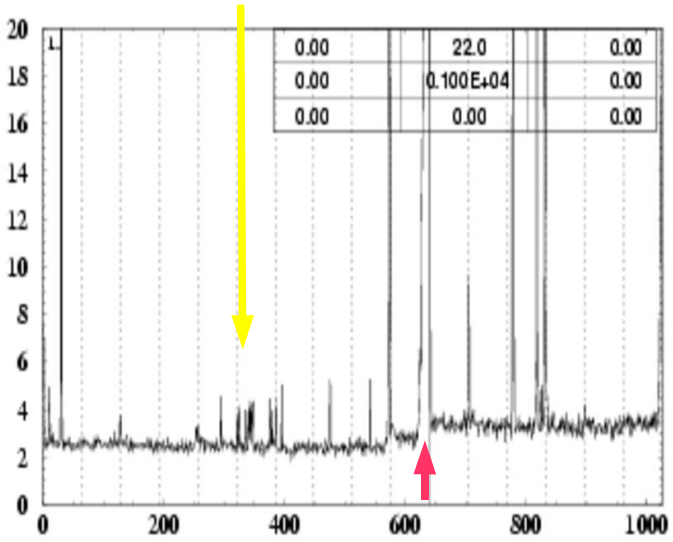
Test shows clearly capacitors 1, 2, 3, 7 and 8 failure.

N.B. Testing afterwards with standard voltages values gives no low sraw channels.
Same test performed on L10AO149, L11AO153, L14AO156 and L12AJ038 has given same result.
Unfortunately this method does not work on K-side.

L12AJ038: noisy peak on VA10

Damaged capacitors

sigmas



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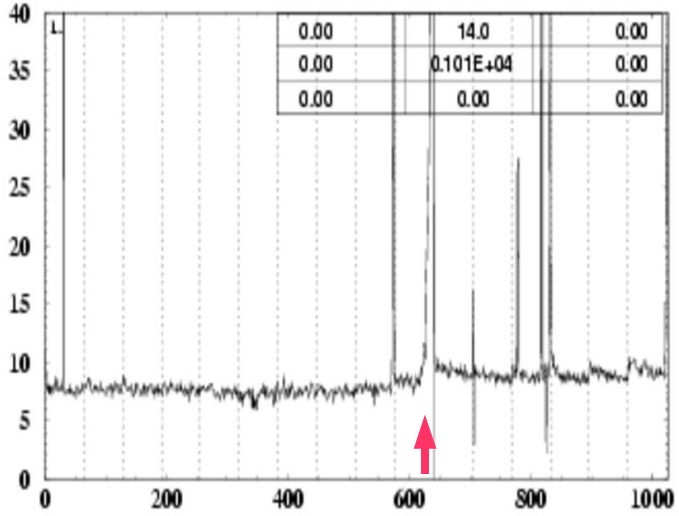
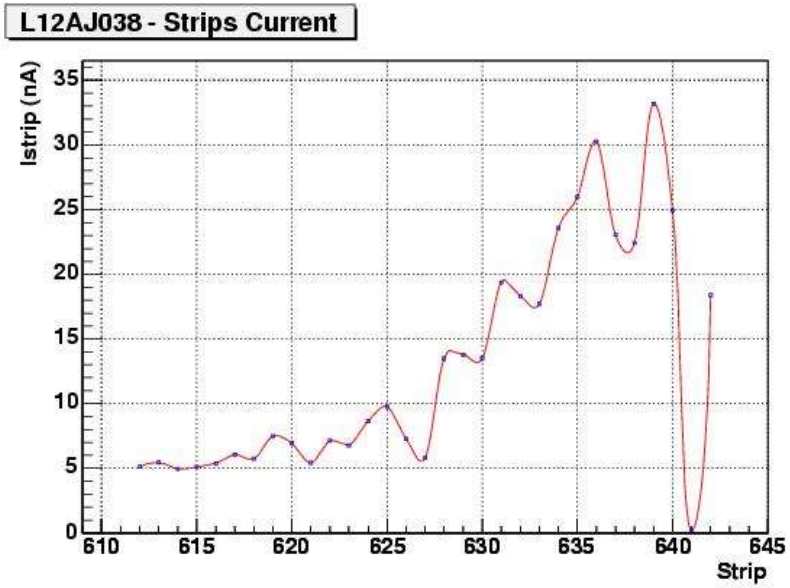


Measured current of silicon strips corresponding to noisy peak:



Problem on chs ~615->640 originates from silicon.

Reparation status :

We have in Geneva 2 K-hybrids
(one to repair L11AO154,
the other still not assigned to any ladder)

Still needed 6 S-hybrid (->Perugia)

We will try to repair L11AO153 and L12AI012
replacing the damaged capacitors
without ungluing hybrid from ladder.

Ladders in stand-by (8/163) :

Not repairable, maybe acceptable:

L15AO094 (sensor 15 damaged and more..)
L12AI067 (problem on VA 10)

Borderline:

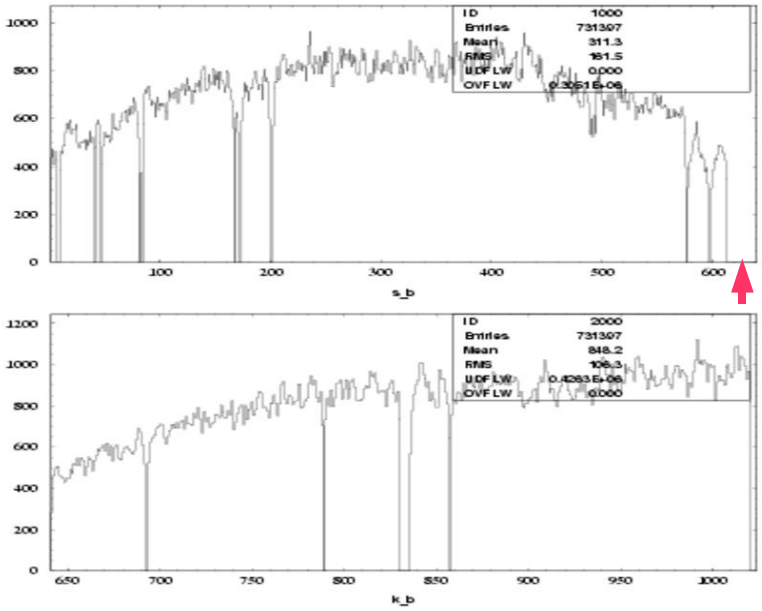
L13AO025 (62 bad channels)
L13AO074 (50 bad channels)
L14AO122 (41 bad channels/17 Chs hole)
L15AO116 (45 bad channels)

Problem not yet understood:

L15AO095 (Very high leakage current after phase-2)
L14AO123 (Dead channels on VA 15 after phase-2)

L12AI067: noisy peak on VA10

Source test



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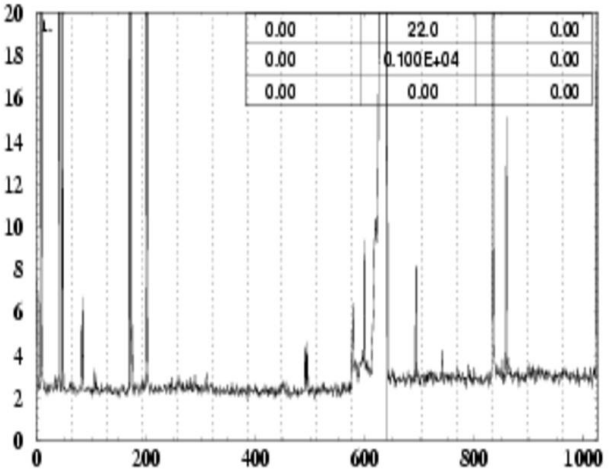

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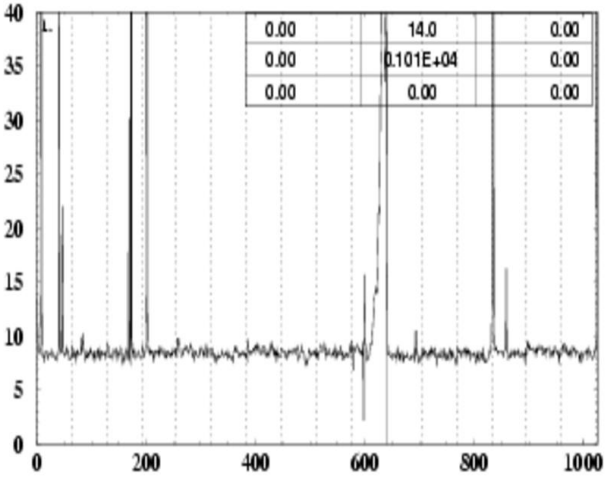
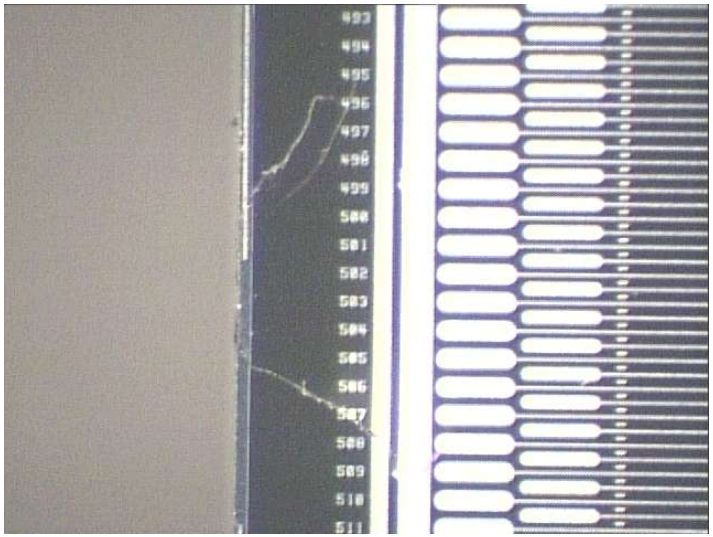


Same problem as L12AJ038,
"hole" on CHs 615->640:
keep as it is or reject?

L15AO094: wafer 15 chipped



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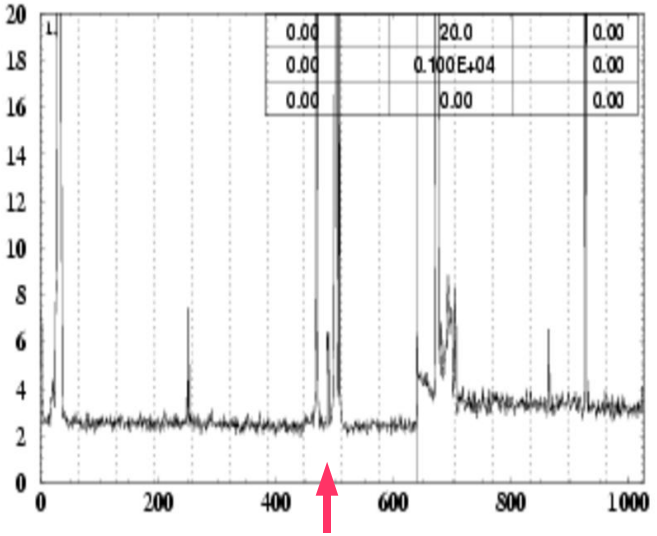
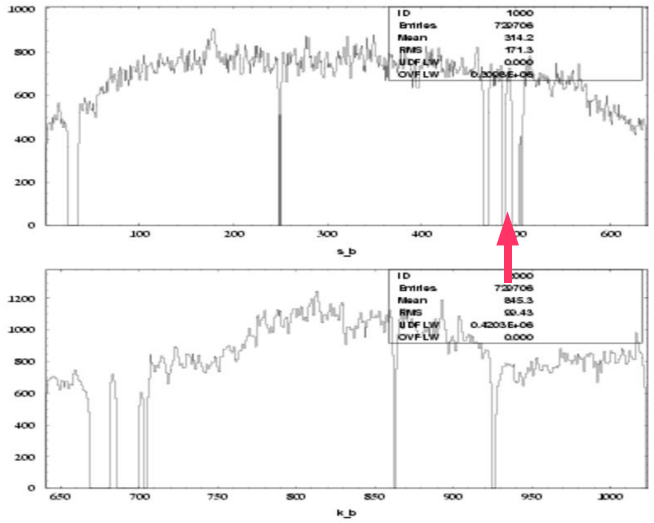


Source Test



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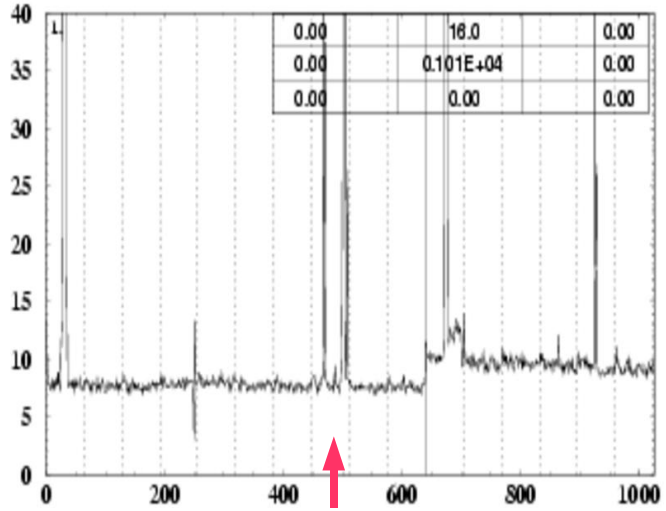
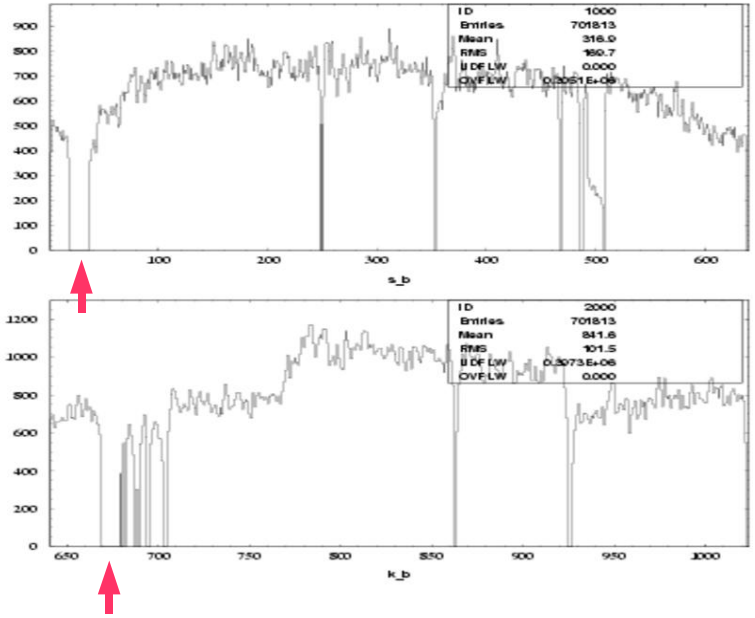


L15AO094:

bonds 495->509 between wafer 15 and 14 have been disconnected

Source Test



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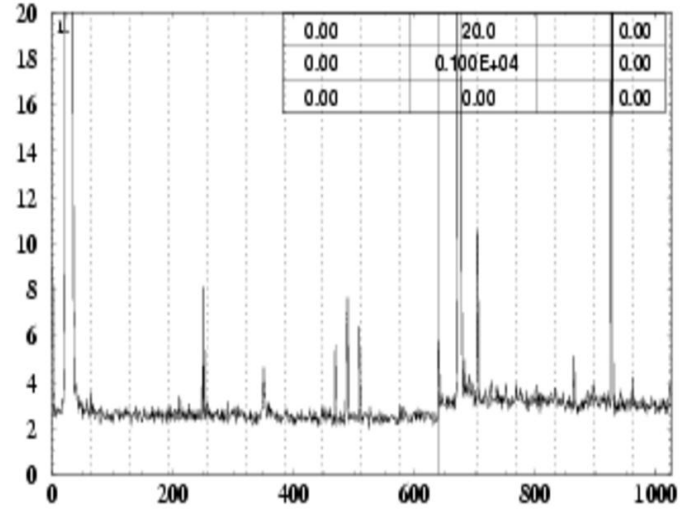

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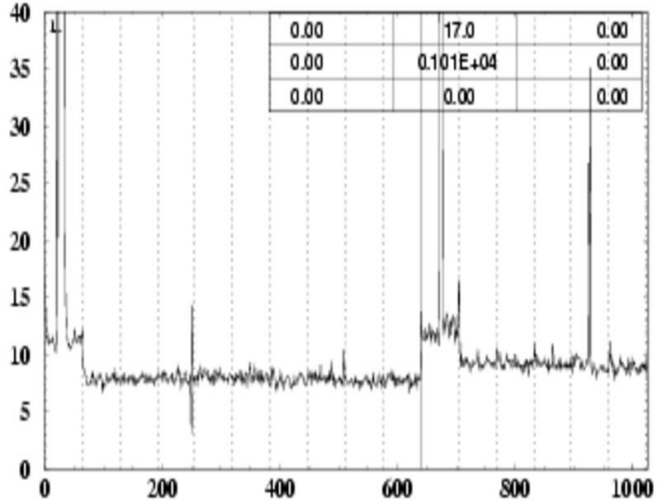

Recovered CHs 495->509 from wafers 14 to 1

Still "hole" on CHs 19->37 and CHs 670->679

Total bad chs: 26 on S-side + 15 on K-side:

keep as it is or reject?

Rejected Ladders (5/163):

1 L11 + 4 L12XI :

L11GI007 (Hs,k (vibr.))
L12AI002 (S2,3)
L12AI009 (S7,8)
L12AI010 (Hk still pbs)
L12AI070 (80 bad chs)

Shorter list comparing to what shown at Montpellier meeting:
L11AI088 recovered
L12AI011 and L12AI013 sent to Perugia for LAZIO project

Open questions:

Hybrids status

Spare ladders to be produced

Decision on stand-by ladders

Planning for the next future:

Complete Layer L7 installation

Reinforce airex gluing on ladders mounted on L2, L4 and L5 and those still in the production phase

Complete hybrids reparation

Repair ladders according to hybrids avaliability

Continue phase-2 and shielding