

ISR Work Progress Report

BMU Week,
Aachen April 28th 2004

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INFN Bologna

Acceptance Tests Update

- 5 MB3 and 5 MB2 arrived at the ISR since the CMS week
- One MB2 reached nominal HV during the acceptance test but had a wire trip after 20'. It was not possible to raise the HV beyond 600V with a 10 microA current limit in the Theta SL connector A (bad HVB?)
- The gas leak test was not done since the chambers have to be opened any way
- All chambers (but MB2P40) went through the cosmic ray tests



115 Chambers in ~ 22 Stacks + 5 MB3 due May 4th

ISR Tunnel April 2004

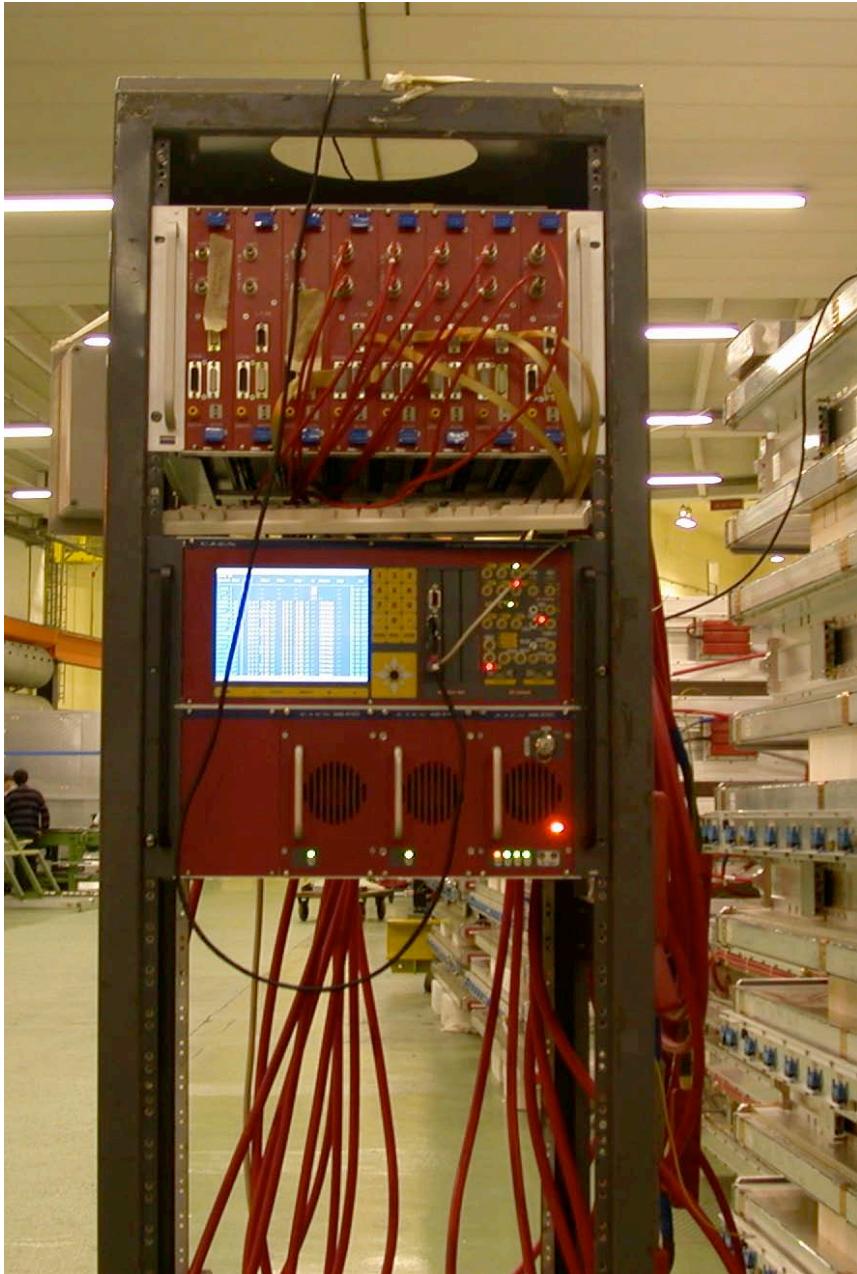


ISR Tunnel April 2004



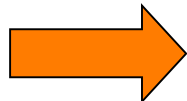
ISR Tunnel April 2004





HV System

- SY1527 extended to 5 DTs
- HV cables too bulky for more than one stack per rack
- Two Sy1527 are operational (10 Chambers)
- In addition we have two Sys127 “Long Term Test” and the CLONE for acceptance tests
- 28 Chamber under HV with one DT/Sys127 channel or 46 with 2DT/ /Sys127 channel



Limited by HV distribution Spiders

HV Long Term Test

- It is important to keep the chambers under HV to check for HV spikes and/or other problems even if the HVBs have to be replaced.
- Notice that this was not possible until last November when we got a monitoring program with database logging.
- Even so data retrieval is very time consuming. A batch procedure to make the monitoring plots would be extremely valuable.
- Compacting the information on a Summary table is also not a trivial task
- One 20channel HVB (old) failed in MB1C17

Tappino Covers

- A total of 16 MB3 SLs are without tappino covers
- MB3C04 is one of these and is among the chambers slated for installation
- MB3C04 was removed from HV since two bad HVBs were taken out from the Theta SL and not replaced.
- The chamber has been under HV (Phi SLs only) for 3 days with only few discharges wire to ground.
- Apparently the absence of tappino covers does not imply discharges wire to cathode

Tappino Covers (Continued)

- Inserting tappino covers when the HVBs are replaced is not trivial, it adds ~2 hours/SL.
- In MB3C04 the tappino covers were put only on the HV side of the chamber.
- We have to decide what to do with the remaining chambers.
- It is important to standardize the chamber construction at all sites, including tricks and fixes:
 - Mylar tape on the outer plates
 - Cathode contacts at both ends,
 -

This would reduce the number of variables in case of problems

MB3_C04 connected from 15-04-2004 11:59:23 to 18-04-2004 19:42:30

tool acting on

- Wires
- Strips
- IBeams
- iMon
- vMon

	dd	mm	yyyy	hr	mn	sc
start	15	4	2004	11	59	23
stop	18	4	2004	19	42	30

set time interval



Wires

CMS_DT:SY127_ISR_2_board02_ch003

iMon

Strips

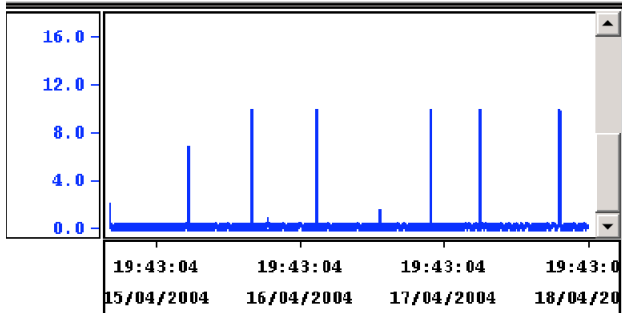
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iMon

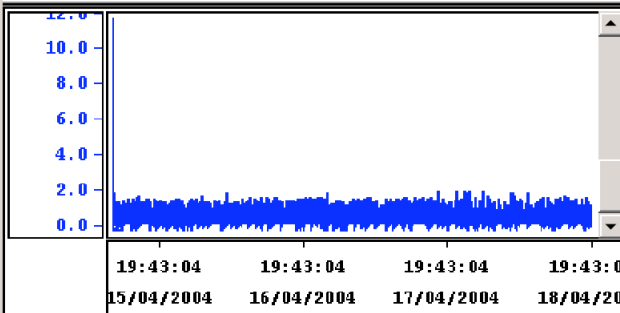
I Beams

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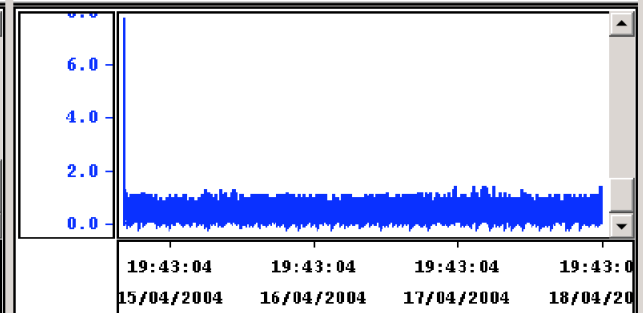
iMon



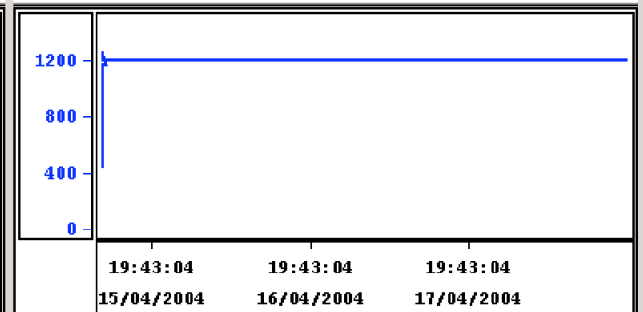
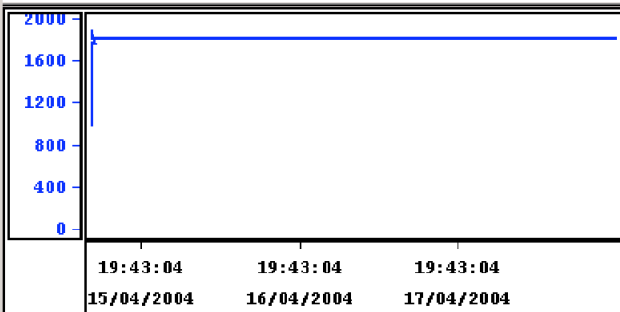
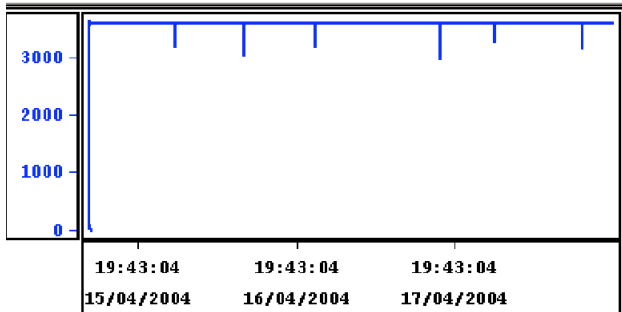
vMon



vMon



vMon



HVB I Substitution

- This task was delayed by the late arrival of HVB_I (end of March) and the Easter vacations.
- Glue drops were put on the ground side of the filter capacitors where the prepreg isolation had been removed
- Last week we replaced HVBS at the same time on MB1 and MB3 without problems
- In total the boards have been substituted in:
 - 6MB1, 3MB1/9-11
 - 5MB2, 2MB2/10
 - 6MB3

Chambers for the First Installation, June-September 2004

	YB + 2				
Sectors	+8	+9	+10	+11	+12
Services	Left (ZpB)	Right (ZpA)	Left (ZpB)	Right (ZpA)	Left (ZpB)
Chambers	MB1P10	MB1P14	MB1P15	MB1P17	MB1P20
Chambers	MB2P22	MB2P23	MB2P24	MB2P17	MB2P26
Chambers	MB3P08	MB3P10	MB3P12	MB3P14	MB3P16
Balance B	Right	Right	Right	Left	Left
Chambers		MB4C29	MB4 L34	MB4 R30	MB4C31
Balance B			R	L	

HVB replaced in all chambers
apart for 20channel HVBs in the MB2 Theta SL

	YB + 2				
Sectors	+2	+3	+4	+5	+6
Services	Left (ZpB)	Right(ZpA)	Left (ZpB)	Right(ZpA)	Left (ZpB)
Chambers	MB1P28	MB1P21	MB1P09	MB1P16	MB1P13
Chambers	MB2P00	MB2P00	MB2P00	MB2P00	MB2P00
Chambers	MB3P18	MB3P30	<u>MB3P32</u>	MB3P24	MB3P04
Balance B	Left	Left	Right	Right	Right
Chambers			MB4 4C3	MB4 4C4	
Balance B			L	R	

- The chambers in red are built with HVB_I but they are naked and must undergo the alignment calibration
- MB3P32 needs HVB replacement and the dressing is less advanced than the other MB3.

Chambers for YB2+ Installation (MB1)

- 4 Chambers with HVB to be replaced (needed for Top)
- HV Long term test started
- Cosmic ray test started
- Dressing at the initial stage, to be completed after cosmic ray test
- Gas leak test to be done on all chambers

Chambers for YB2+ Installation (MB2)

YB2+Top:

- Chambers still in CIEMAT (**alignment calibration, dressing**)

YB2+ Bottom:

- 20 channel HVB **to be replaced in 5 Theta SL**
- MB2C23 wire to ground discharges in Theta B (removed)
- MB2C26 wire to ground discharges in Phi 1B (removed)
- MB2C17 Intermittent HV problems in Theta A (clicking), Phi 1 SL. Fixed last December by Mary-Cruz
- Cosmic ray started but noise problems with the dressed Theta SLs
- MB4/10 still naked (no drawings for HV cabling yet)

14-01-2004 00:00:00 09-03-2004 12:17:28 26-03-2004 17:28:20

MB2_C17 connected from 26-03-2004 17:28:20 to 14-04-2004 10:50:25

tool acting on

- Wires
- Strips
- I Beams
- (Mon)
- vMon

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stop	14	4	2004	10	50	25

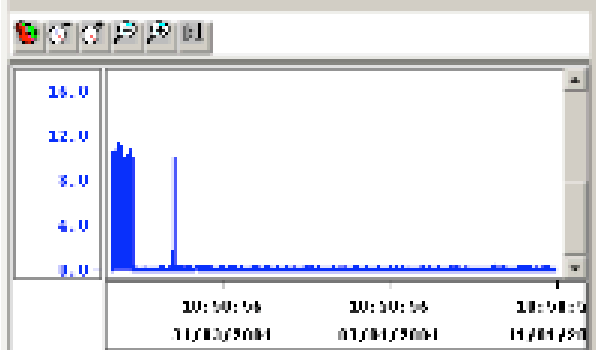
set time interval



Wires

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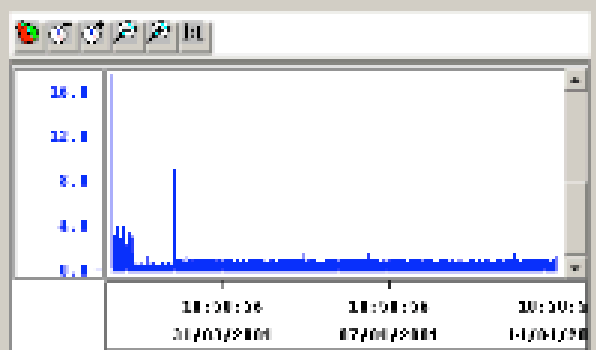
(Mon)



Strips

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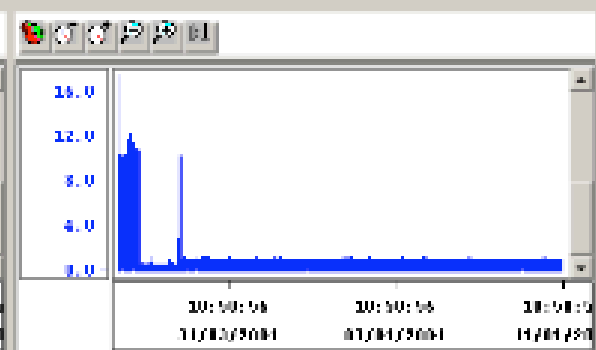
(Mon)



I Beams

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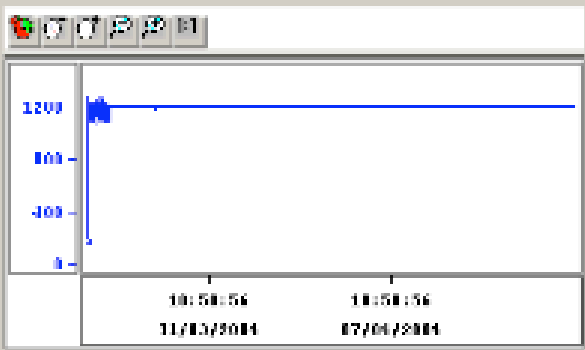
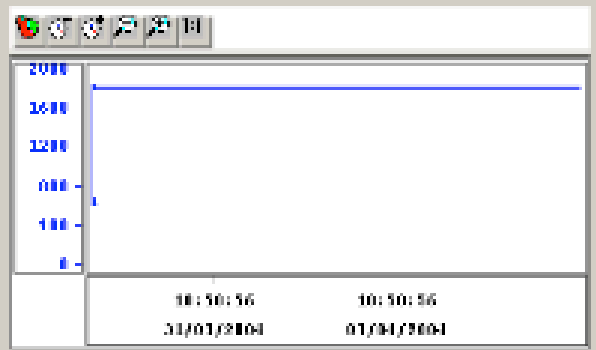
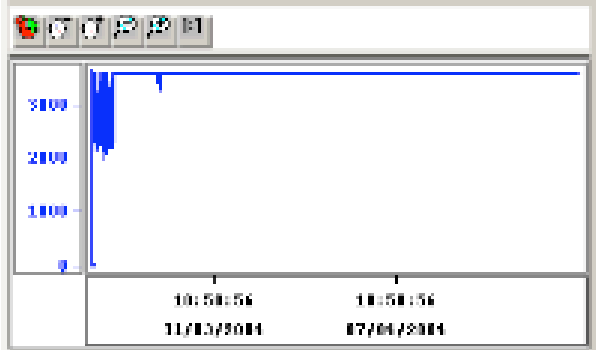
(Mon)



vMon

vMon

vMon



01-04-2004 00:00:00

MB2_C17 connected from 01-04-2004 00:00:00 to 24-04-2004 15:48:19

tool acting on

- Wires
- Strips
- IBeams
- iMon
- vMon

	dd	mm	yyyy	hr	mn	sc
start	1	4	2004	0	0	0
stop	24	4	2004	15	48	19

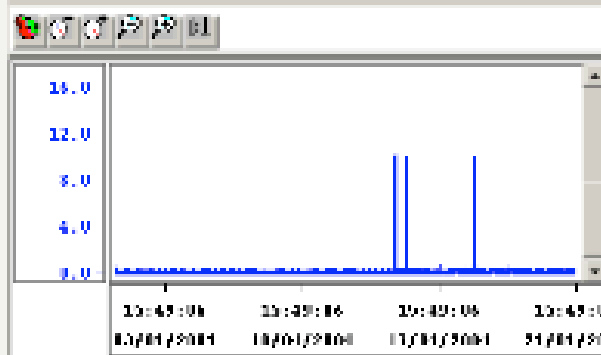
set time interval



Wires

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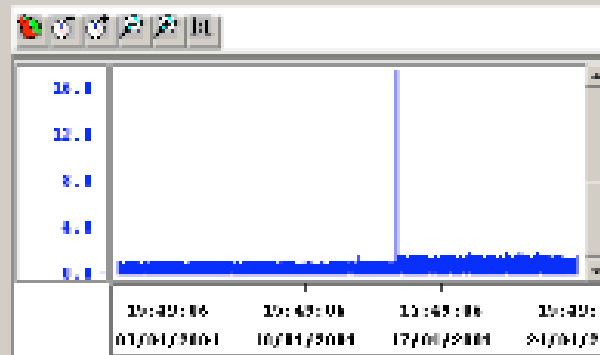
iMon



Strips

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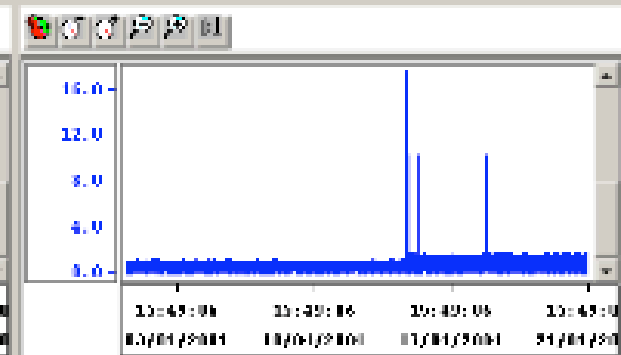
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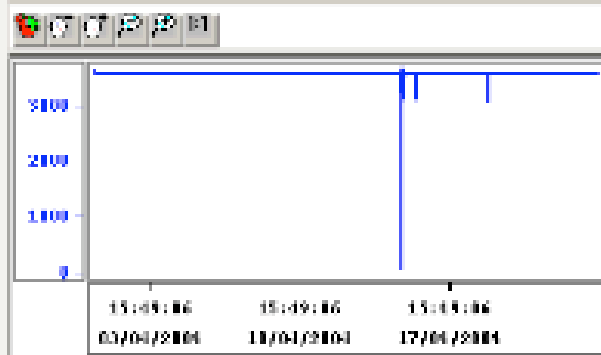
I Beams

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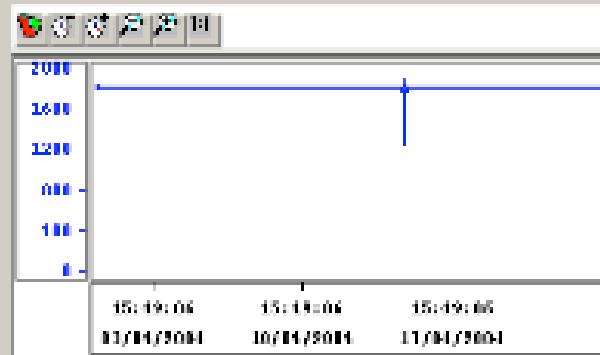
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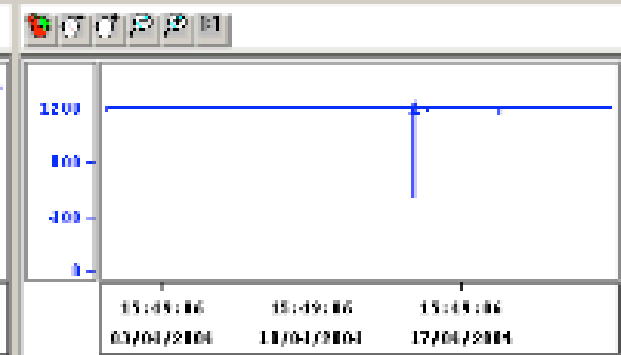
vMon

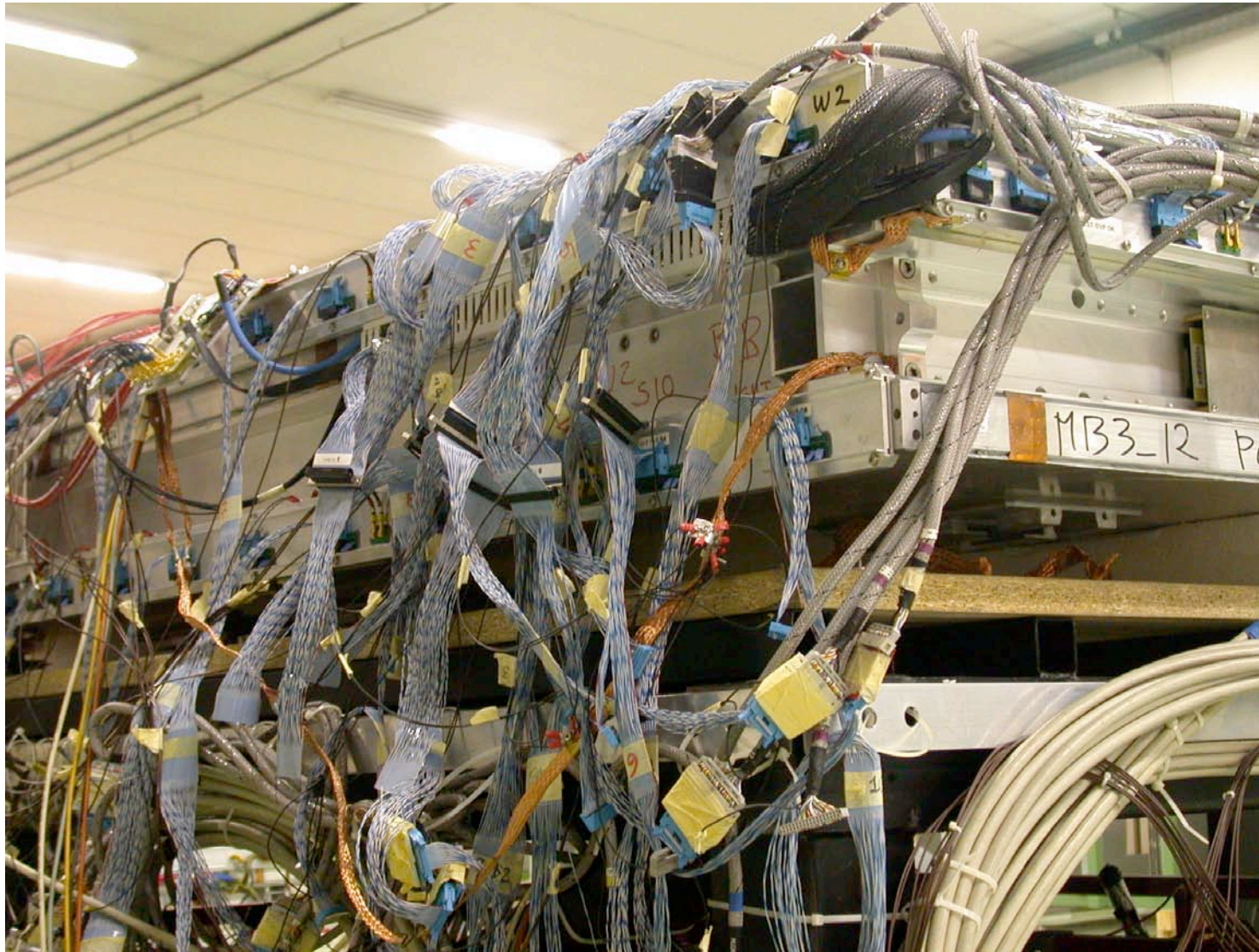


vMon



vMon





- New splices needed from Theta FE cables to TDC cables (Matteo)
- Replace all splice cables (naked chambers) flakey contacts
- Upgrade cable layout to improve noise and to accommodate Torino MB4

Chambers for YB2+ Installation (MB3)

YB2+Top:

- 2 MB4/4 arrive at ISR next week (**alignment calibration, dressing**)
- HVB still to be replaced in 3 Chambers

YB2+ Bottom

- HV test restarted after intervention on Theta SI and some Phi SLs with disconnected cathodes
- MB3C08, C10, C12 and C16 under HV for ~2 months with Sy1527.
- MB3C16 Phi2 SL puzzle, L3 W1 discharges to I-beam L1
- MB3C10 Theta SL (L3 W0 spikes wire/I-beam, L4 W1 discharges to ground)

I 1 THETA PHI 2

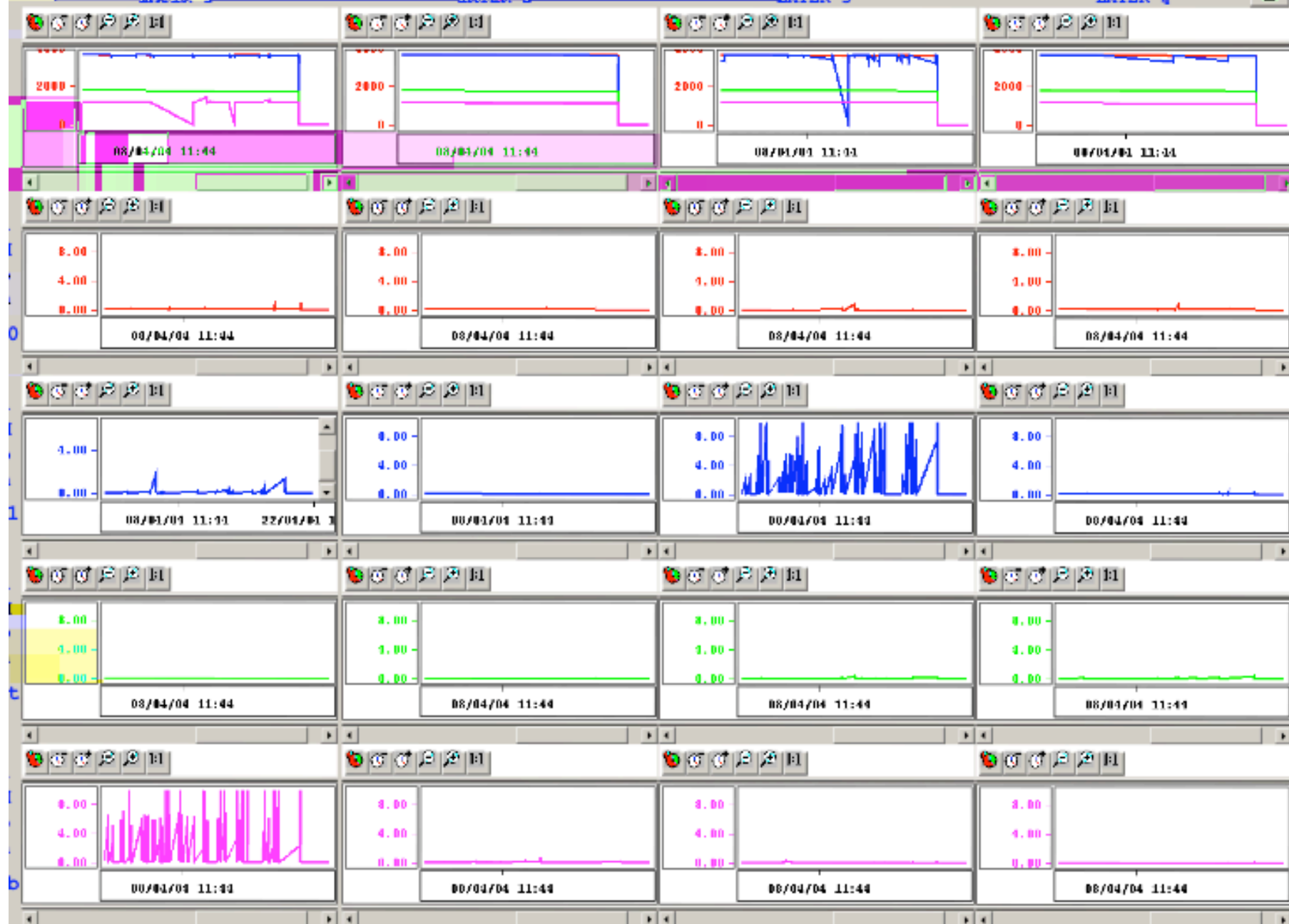
set interval

LAYER 1

LAYER 2

LAYER 3

LAYER 4



Chambers for YB2+ Installation

- The 20 channel HVBs should be replaced in the MB2 Theta SLs as soon as possible.
- The HVB should be replaced in the remaining chambers as soon as possible
- Repair work in the chambers is extremely urgent, it requires additional tests with cosmics and blocks dressing task.
- The chambers HV behavior is very worrying: we have intermittent problems (MB2C17), sporadic wire to ground discharges that become sustained discharges, and wire to cathode discharges.
- We need a plan on how to proceed, for instance when we give up and when we must intervene (in this case the sooner the better)

Chamber Production

- The Chimney chambers for YB+1 sector 4 should be at the ISR by the end of the year at latest.
- Legnaro must produce 1MB3 and 2 MB4/4 and is therefore the most critical assembly site.
- The assembly sites should look in their data bases and decide if any of the chambers already built should be considered as spares.

DT Dressing

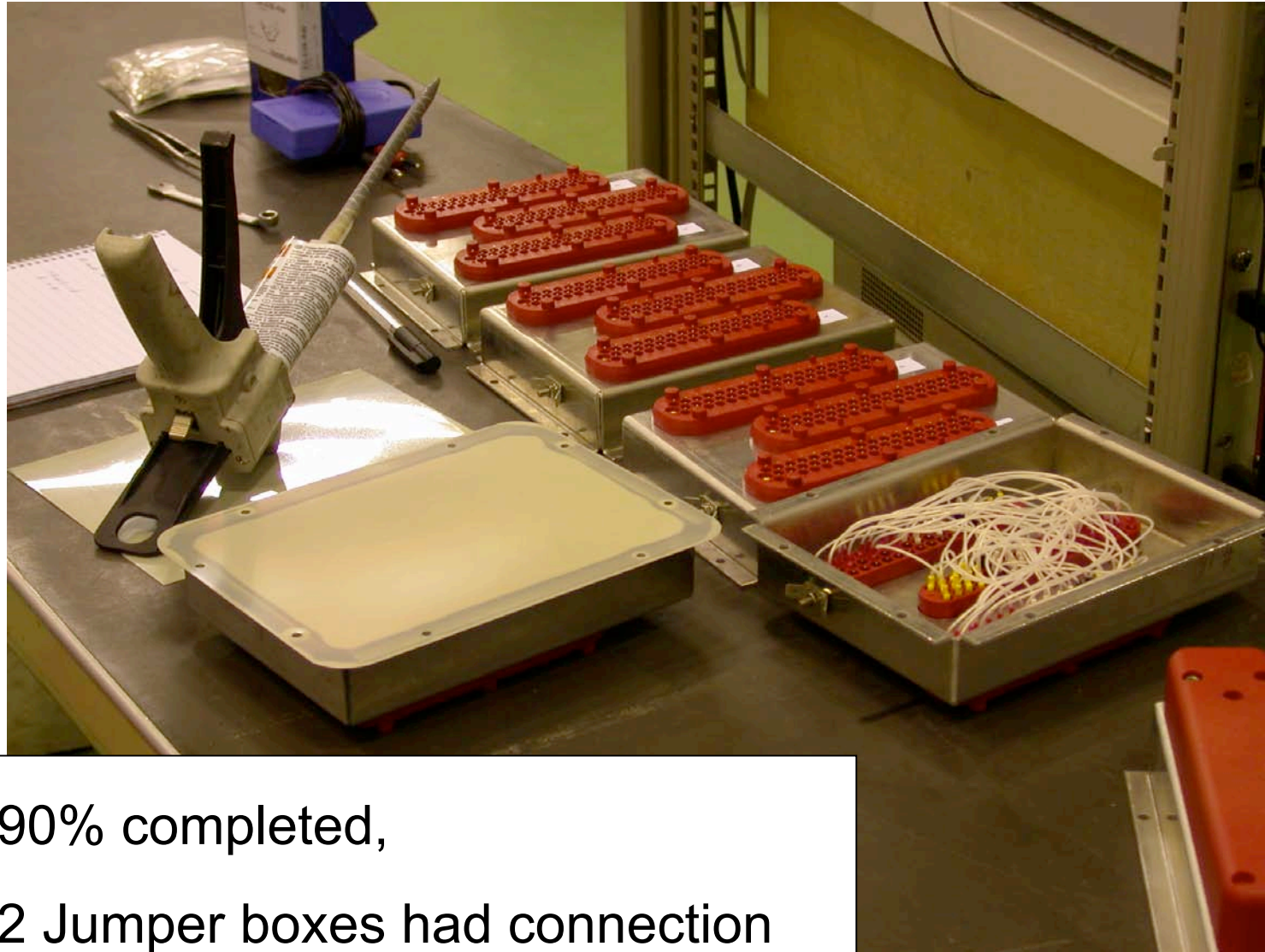
Some tasks must be done **after** the HVB substitution:

- Grounding straps at the HV side,
- Theta SL Front-end cabling (**time consuming**),
- Cooling pipes.

The components needed for these tasks are prepared in advance to speed up the dressing:

- Front-end cables for the Theta SL,
- Low Voltage cables

by the personnel from IHEP



90% completed,

2 Jumper boxes had connection problems

Mapping for MB1 PHI corrected



LV Cable assembly

2 hours/cable

Length defined for
all Theta SLs



DT Dressing Summary (Major Items)

Type	@ISR	Align		HV/Gas	HV Cable	⊖ FE Cables	CR TEST
		L	R				
MB1P	23	12	11	23	23	0	23
MB1M	9	5	4	9	9	0	9
MB4/9,11	4	2	2	0	0	0	4
All MB1,4	36	19	17	32	32	0	36
MB2P	24	12	10	22	22	9	18
MB2M	14	5	5	10	10	0	9
MB4/10 L	3	2	1	0	0	0	3
MB4/10 R	3	2	1	0	0	0	3
All MB2,4	44	21	17	32	32	9	33
MB3P	23	9	9	18	18	12	23
MB3M	10	5	5	10	10	0	10
MB4/4	2	0	2	0	0	0	2
All MB3,4	35	14	16	28	28	12	35

Align: the alignment calibration has been done

HV/Gas: The HV cables, gas pipe, LV, DCS cables .. have been inserted in the chamber.

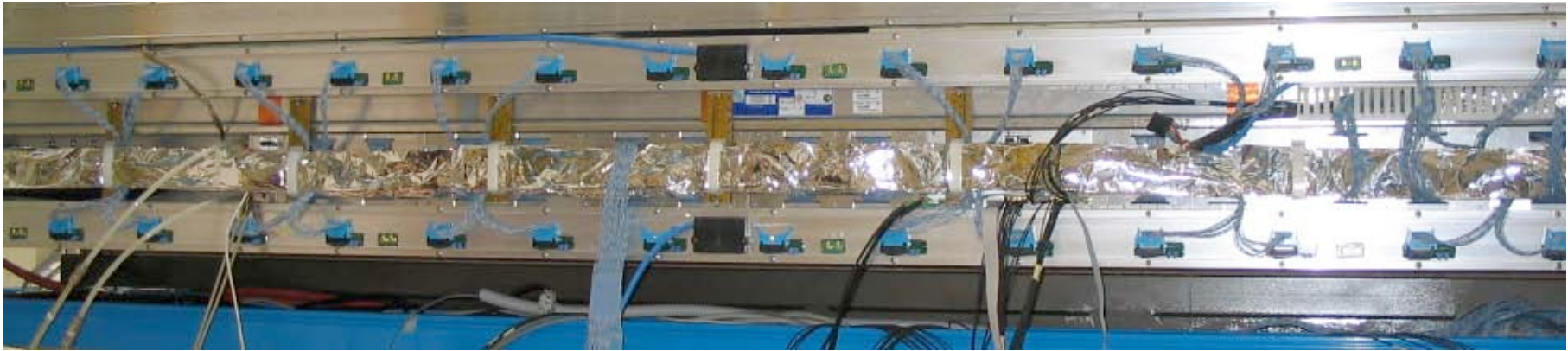
This operation must be completed before the alignment calibration.

HV Cables: The HV cables have been installed For the Phi SL the connectors have been soldered and the cables tested.

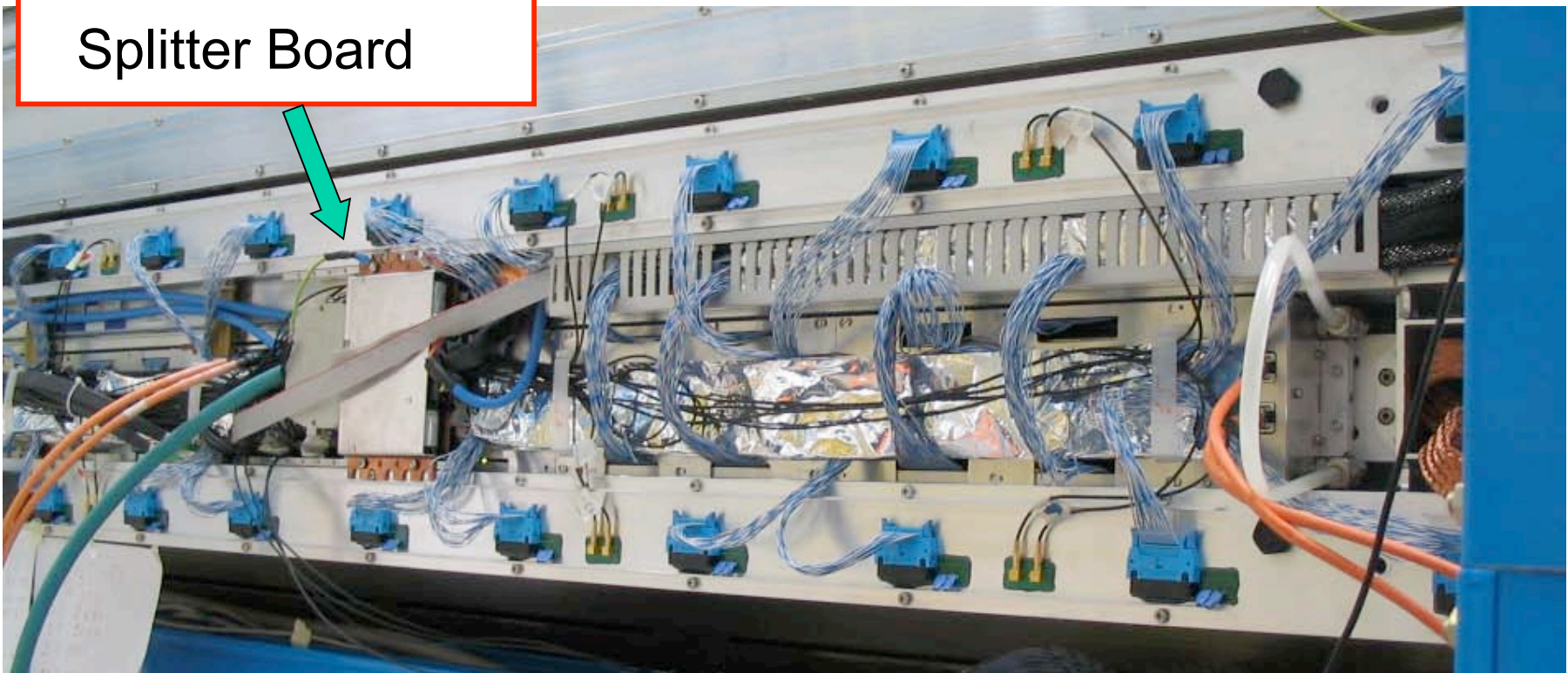
Theta FE: the cabling of the Theta SL has been completed

CR: The chamber has been tested with cosmic rays

MB3 Mini Crate Cabling (Legnaro)



Splitter Board



Minicrate Cabling

- The layout of the Front-end cables is difficult and time consuming. It will require “dedicated people”.
- It is important to identify the items that can be prepared in advance in order to minimize the impact of the cabling during the MC commissioning.
- Once the cabling is completed, the MC components are not accessible any more. In case of problems the cables have to be removed.
- MC insertion on installed chambers looks difficult, it should be tried as soon as possible

Summary

- It is crucial that the HVB substitution is completed as soon as possible, particularly on the MB2s
- At least one “expert” person should be at the ISR until the repair work is completed for the YB2 bottom installation and the MB1 for YB2 top
- The HV problems must be addressed and additional manpower must be dedicated to check the HV behavior of the chambers.
- As delays accumulate, the work for substituting HVB, testing the chambers and dressing for installation is compressed in an ever shrinking time frame. We must foresee adequate manpower at the ISR, especially physicists and expert technicians for these tasks.
- The next round of alignment calibration must be scheduled as soon as the next batch of MB2 with HVB_I arrives at CERN (mid June?).