ISR reception and tests

Status report

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Chambers reception

- **Three** chamber shipments have been delivered to ISR since September CMS week:
  - Legnaro, 10/04: 2 MB3-, 3 MB4/4
  - Madrid, 11/04: 3 MB2-, 2 MB2Chimney
  - Aachen, 12/04: 4 MB4/9-11, 2 MB1-, 2MB1Chim (New HVBs)
- Total of chambers at ISR = 123 chambers (+ 33 already installed YB+2)

- All them (except 3 last shipments) passed through alignment bench.

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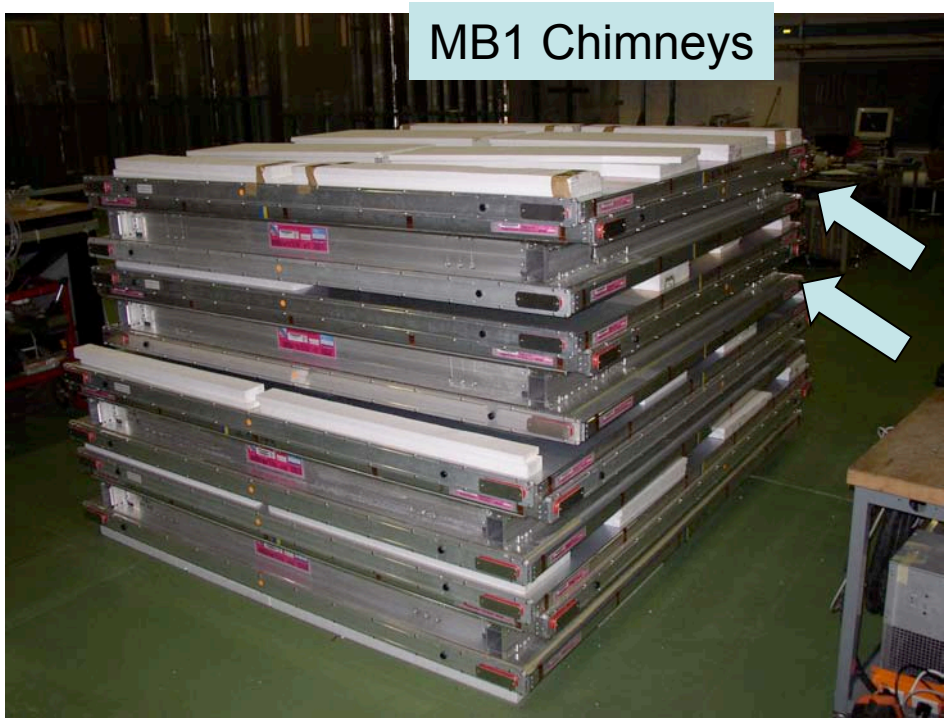
Chambers reception

Chimney chambers already at ISR



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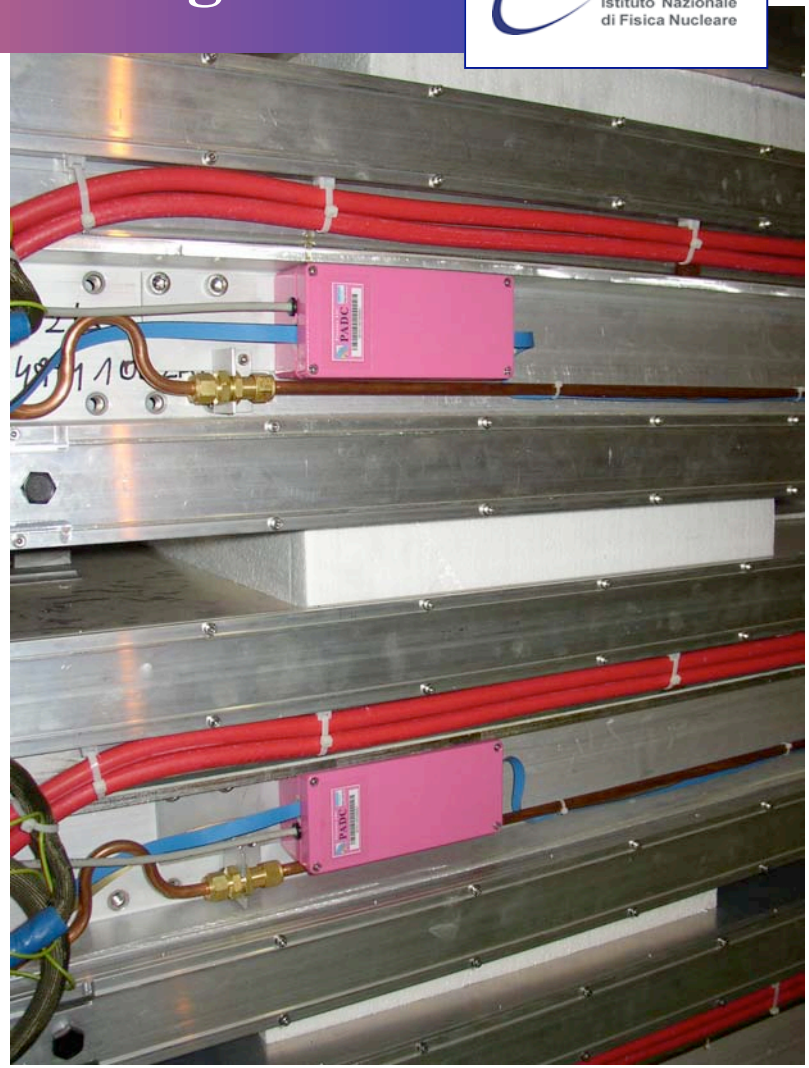
Reception & Dressing

- **Chambers for wheels YB+2, YB+1 and YB0 equipped with PADCs.**
- HV cables, gas piping, gas manifolds in almost all aligned chambers.



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Status of ISR chambers

Chambers needed for surface installation

Type	Need		@ISR	Align		HV/ Gas	HV Cable	? FE Cables	CR TEST
	L	R		L	R				
MB1P	12	12	11+5	5	9	14	14	0	14
MB1M	12	12	15	8	7	15	15	0	9
MB4/9,11	5	5	9	2	3	2	2	0	4
MB1Chim	1	1	2						
All MB1, 4	30	30	42	15	19	31	31	0	27
MB2P	12	12	20	7	12	19	19	4	19
MB2M	12	12	17	7	7	14	14	0	8
MB4/10 L	3	2	2	1	1	0	0	0	2
MB4/10 R	3	2	2	1	1	0	0	0	2
MB2Chim	1	1	2						
All MB2,4	31	29	43	16	21	33	33	4	31
MB3P	13	12	13	5	8	13	13	3	13
MB3M	12	13	19	9	8	17	17	0	16
MB4/4	6	4	6	0	3	0	0	0	2
All MB3,4	31	29	38	14	19	30	30	3	31
MB4P	8	7							
MB4M	7	8							
All MB4	15	15							
Total	177+33		123						

Quality tests

- Chambers for YB+1 have been moved during last weeks to working area and kept under HV (despite HVB replacing) to spot possible problems before operations.
- HV suppliers: 3 SY127 (12 chambers each) and 3 SY1527 (better granularity) available for tests & monitoring.
- Automatic procedure for HV trending plots generation (M. Giunta).

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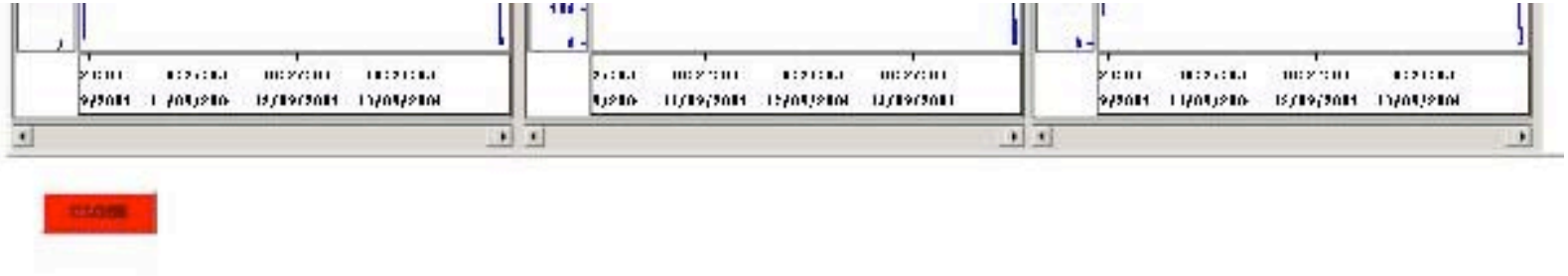
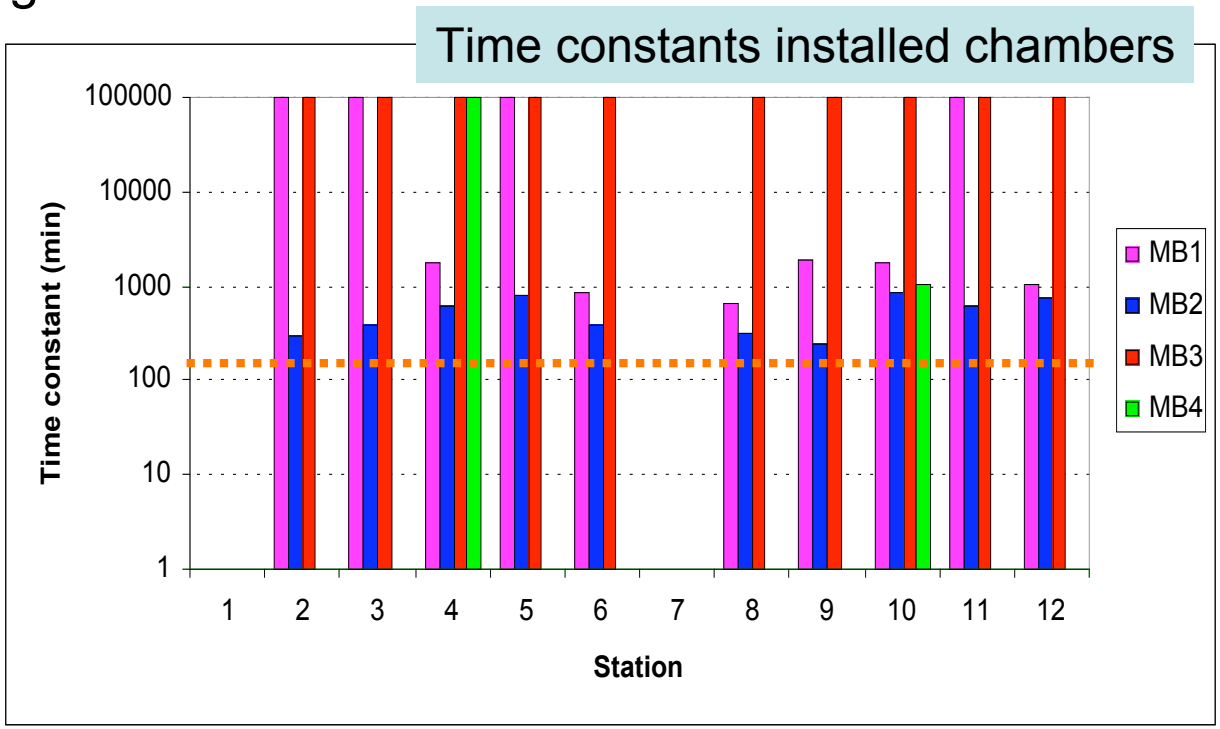
Quality tests

- Still some HV spikes observed (wire to ground, wire to cathode discharges).



Pre-commissioning for installation

- Work on chambers prior to installation
  1. Regular trending of HV behaviour.
  2. Last certification with cosmics.
  3. Theta FE cabling + Scalers test.
  4. Gas tightness test (after eventual reparations) with gas manifolds.



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Pre-commissioning for installation

- Common problems in final chamber certification:
  1. Generalized noise, indicating dirtiness inside (clean up after some time under high flux)
  2. Bad cathode connections.
  3. Discharges after some time (usually under high gas purity). Isolation of unplugged pins or damaged shrink tube, sparks in HVC…
  4. Noisy channels (FEB/SCbus cable replacement, grounding…)
  5. Dead FE channels (FEB/HVC shortcut)
  6. Malfunctioning masks (FEB problem, bad grounding…)

- STATISTICS of interventions under preparation (some feedback needed)

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Minicrate installation & tests

- 9 chambers have been installed with MC in both October and November installation rounds.
- MC fully cabled from Legnaro
- **Procedure for MC test:**
  1. Test of MC after transport (about 30-40 minutes), only a PC with serial port required:
     1. Test boot info (info sent by MC on boot)
     2. Test serial ports
     3. Test MC program info (info sent by MC after loading internal control program)
     4. Check results of the MC internal test (a simple test performed by the MC itself)
     5. Boundary scan test to check all internal connections
     6. Check configurability (BTI, TRACO, TSS, TSM, TDC, Threshold, Width)
  2. MC installation on chamber: Cabling, covers assembling... (half a day, two people)

F. Gonella

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Minicrate installation & tests

3. Complete test of assembled MC (about 2h)
   (http://www.pd.infn.it/~parenti/talks/padova-29ott04.pdf)
   1. Same tests sequence as 1.-
   2. Check TDC functionality
   3. BTI connectivity test (emulation and with test pulse)
   4. Test crosstalk (cables, connections) with test pulse
   5. Test correctness of cabling
   6. Test alignment functionality
   7. Test PADC
4. Test of MC at SX5 (about 30 minutes):
   1. Same tests sequence as 1.-
   2. Test Alignment, PADC & RPC interface
   3. Test boundary scan (BO)

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Minicrate tests

- **October installation**: 2 chambers with MC
  MB1C28, MB1C10 (Test Beam)
- **November installation:** 7 chambers with MC
  MB1C20, MB1C13, MB1C9
  MB2C49, MB2C46
  MB3C4, MB3C18 (Test Beam)

- Problems summary (October):
  - 1 TRACO jumper on TRB3 (32channels) fixed
  - 1 short on feedthru board
  - 1 slow mask malfunctioning (probably due to bad connection). FEB + SCbus cable replaced

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Minicrate tests

- Problems summary (November):
  - 1 TRB changed
  - 4 connectors badly inserted
  - 1 bad TP channel: FEB replaced (present with scalers)
  - 2 slow mask malfunctioning (probably due to bad connection). 2 FEB + SCbus cables replaced
  - 1 Boundary scan problem found. Fixed in Legnaro

- Observations:
  - Insertion of clock and serial connectors on MC is very complicated. In some cases, serial debug port not accessible after cabling.
  - Some black signals connectors found disconnected after cabling.

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HVB replacement

- 3 Aachen technicians, 2 weeks at ISR, exchanged old HVBs for HVB-v5 in 5 MB1s. (~1 chamber/day)
- Fast HV test after intervention.
- After replacement, roughly 2 days needed for gas clean-up in order to be ready for cosmic test.
  - Operation to be done as fast as possible!!
- Each chamber required (at least) 2 cosmic rounds for certification (Reparation work still in progress).
- Problems found mainly disconnected pins, noise.

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HVB replacement

- Problems found mainly disconnected pins, noise.

MB1C11	3 Ibeam contacts
MB1C22	• Noise (FEB + HVC replaced) • 1 Bad Ibeam contact
MB1C23	•Bad Ibeam contact
MB1C36	•New dead cell found in signal feedthru
MB1C38	•2 bad Ibeam contact

- **REQUEST: Spare components for eventual actions on chambers.**

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