



# Status of MB4 production in Torino

## 21<sup>th</sup> September 2005



- . SL and Chamber production rate and status of production
- . Sample of QC in Torino on SL and on Chamber
- . Production Data Base in Torino
- . Material procurement

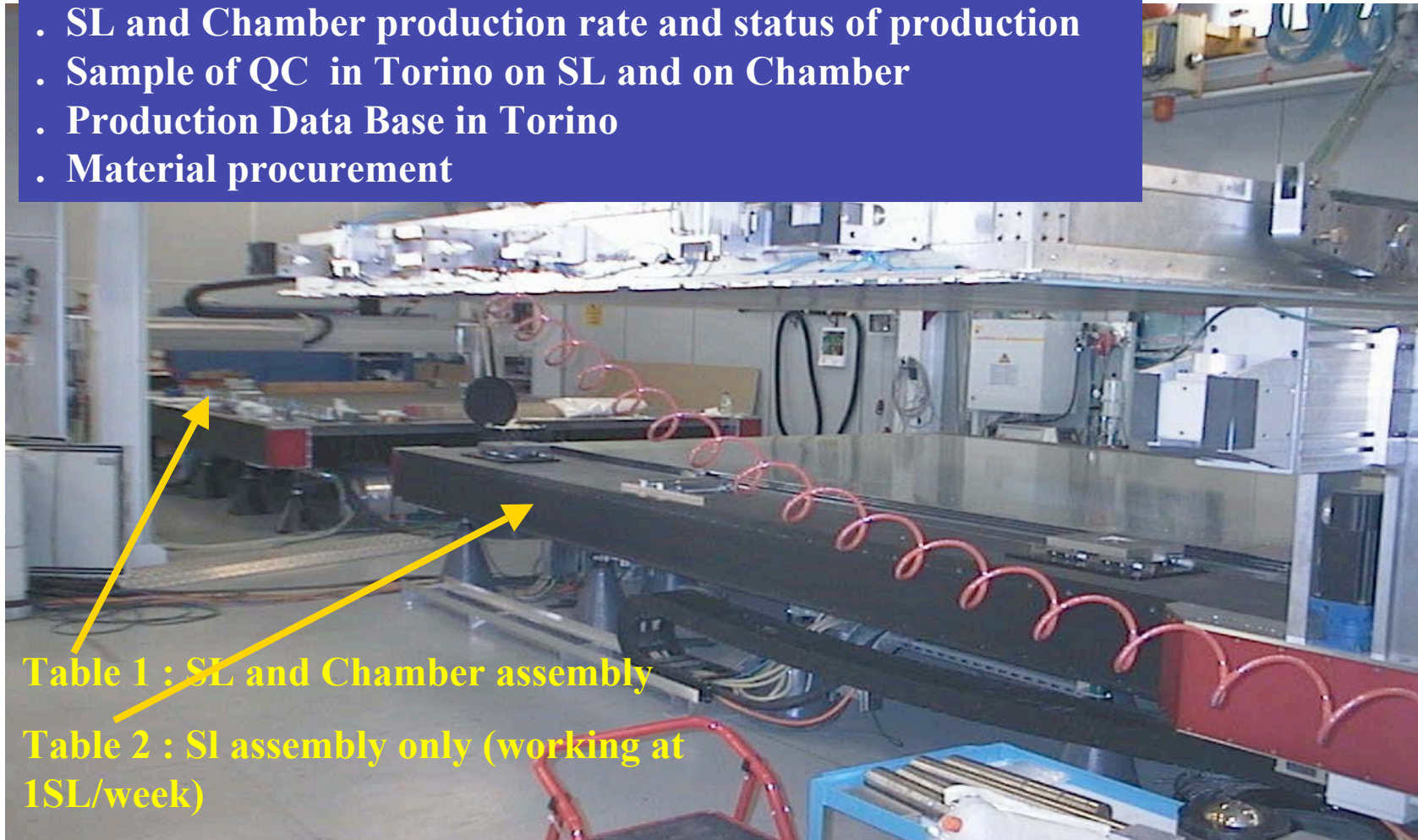
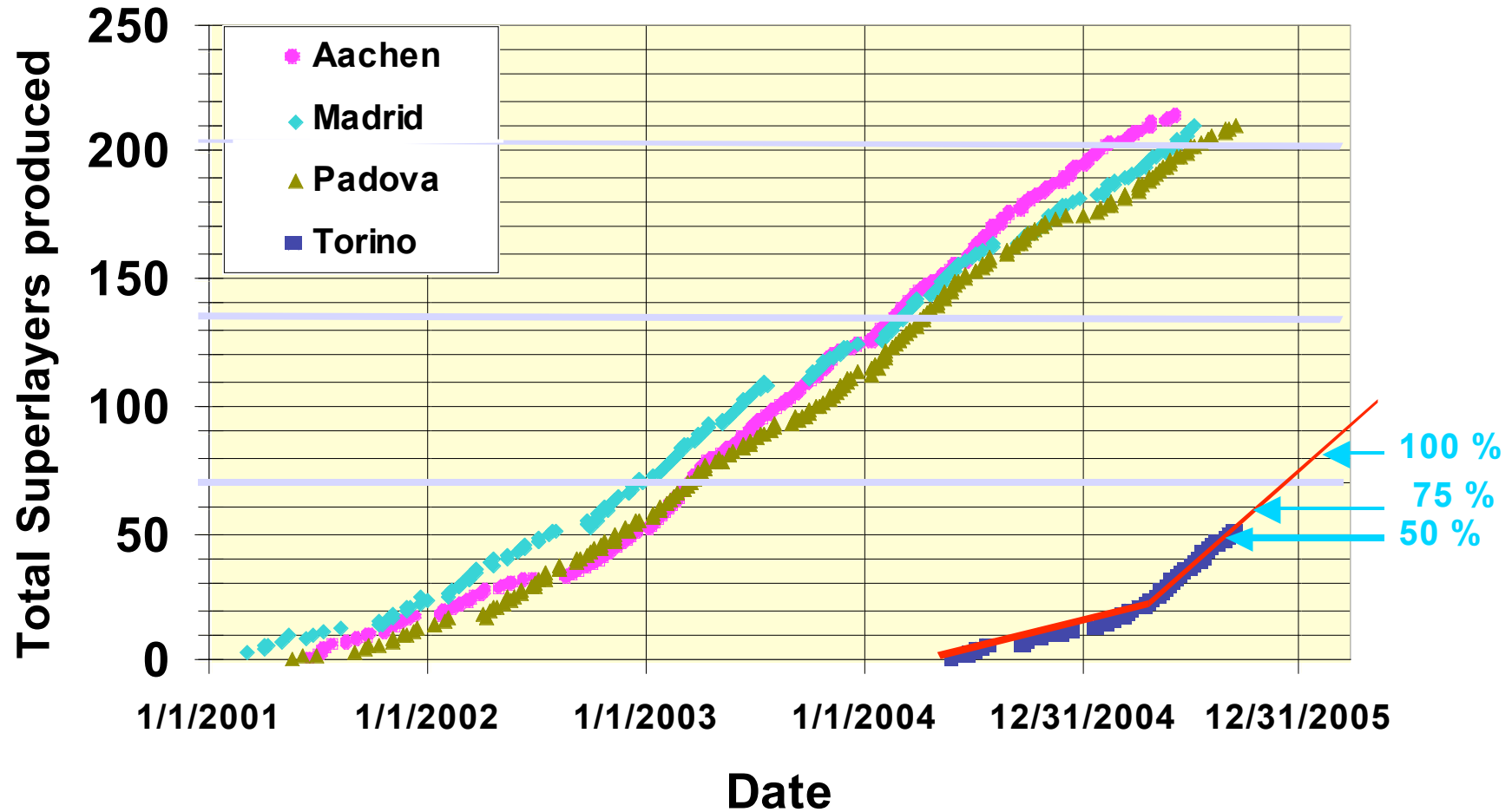


Table 1 : SL and Chamber assembly

Table 2 : SL assembly only (working at 1SL/week)

# SL production rate

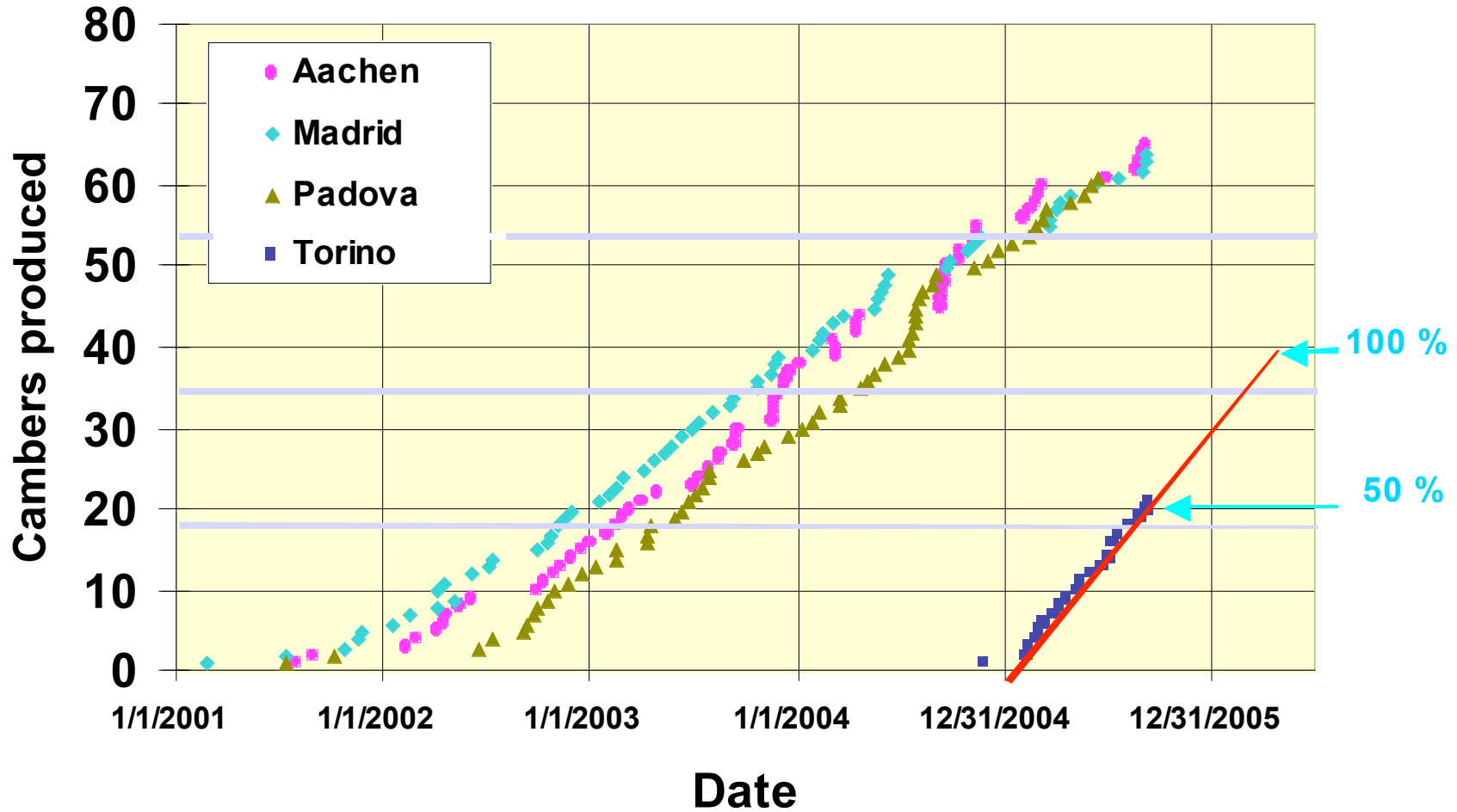




# Chamber production rate

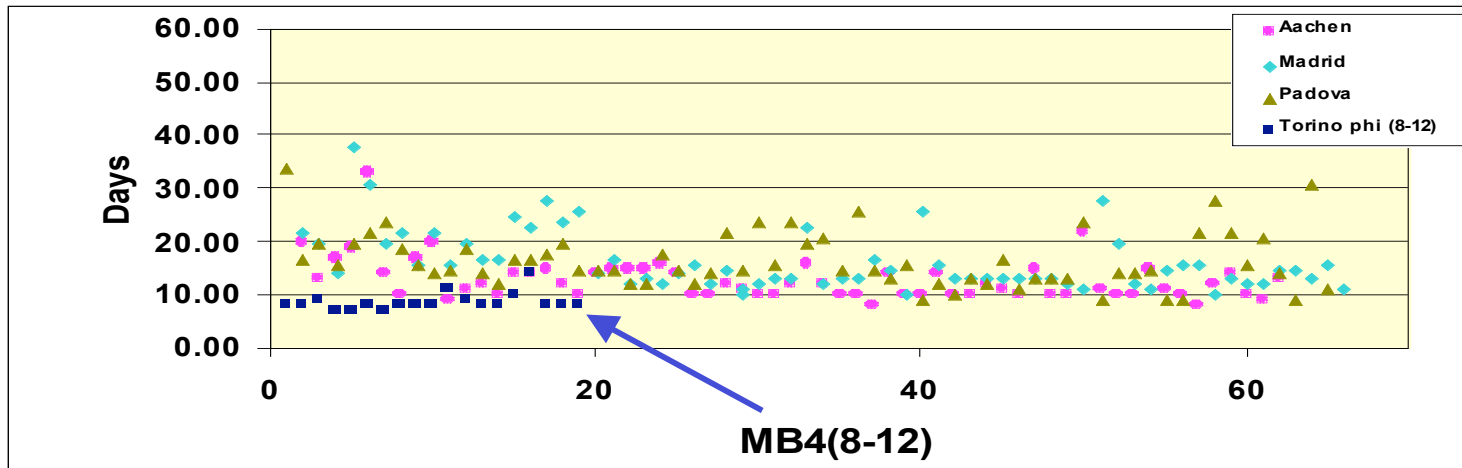
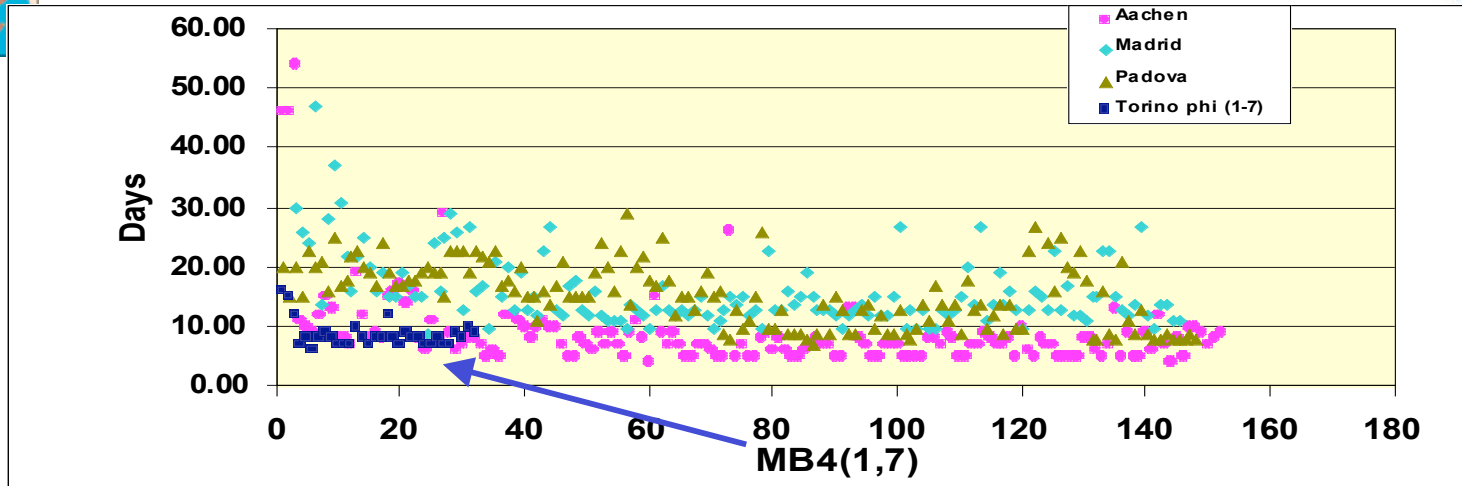


## Chambers OR 3 Fully Tested SuperLayers





# SL production rate



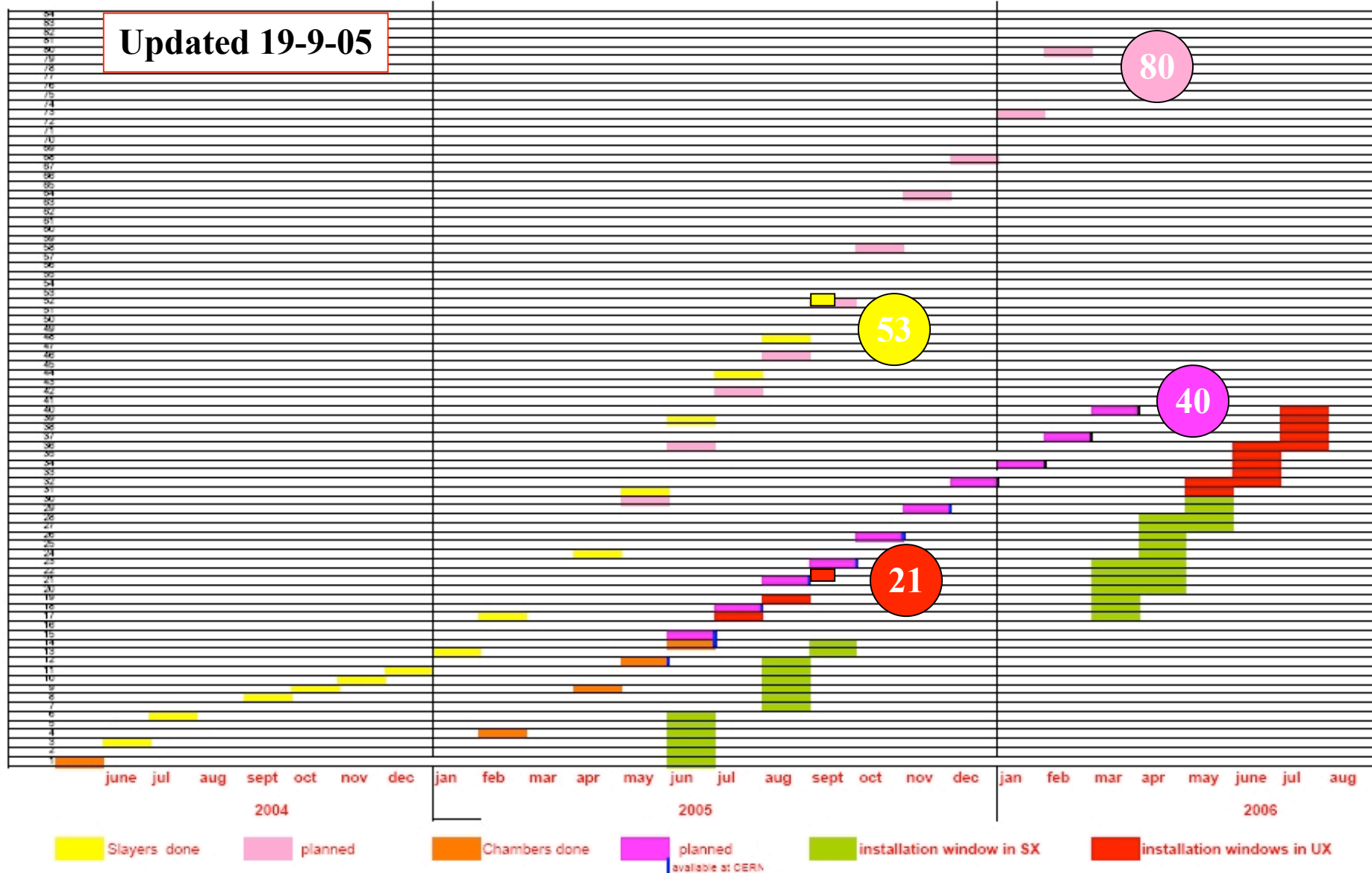
**Nominal Production rate of 6SLs and 3 Chambers per month**



# Status of MB4 Production



Updated 19-9-05





# Torino DT Production Status



<b>SL Mechanically assembled MB4(1,7)</b>	<b>32 (53%)</b>
<b>SL Tested MB4(1,7) type</b>	<b>32</b>
<b>SL Mechanically assembled MB4(8,12)</b>	<b>21 (95%)</b>
<b>SL Tested MB4(8,12) type</b>	<b>17</b>
<b>Chambers assembled</b>	<b>21 (52%)</b>
<b>Chambers tested</b>	<b>19</b>
<b>Chambers at CERN</b>	<b>15</b>



# SLs repaired or to be repaired



- Overpressure problem at CERN on MB4(1,7)\_010  
**REPAIRED and TESTED at CERN**
- SL(1,7)\_06, SL(8,12)\_010, SL(1,7)\_015 did not pass the overpressure test. Plates unglued. SLs parked waiting for being repaired at the end of production.
- Chamber MB4(1,7)\_008 parked in Torino due to unglueing of last plate (blob) in the central area



# Disconnected Channels



SL num	Cell ID	Layer ID
MB4(1,7)SL_001	75	3
MB4(1,7)SL_004	46	1
MB4(1,7)SL_011	4	4
MB4(8,12)SL_011	37	4
MB4(1,7)SL_018	3	4
MB4(8,12)SL_014	5	2
MB4(1,7)SL_024	45	3
MB4(1,7)SL_026	75	4
MB4(1,7)SL_030	9	4

**In 53 SLs built = 21200 cells  
only 9 cells have been disconnected = 0.04 %**





# Chamber Shipment to CERN



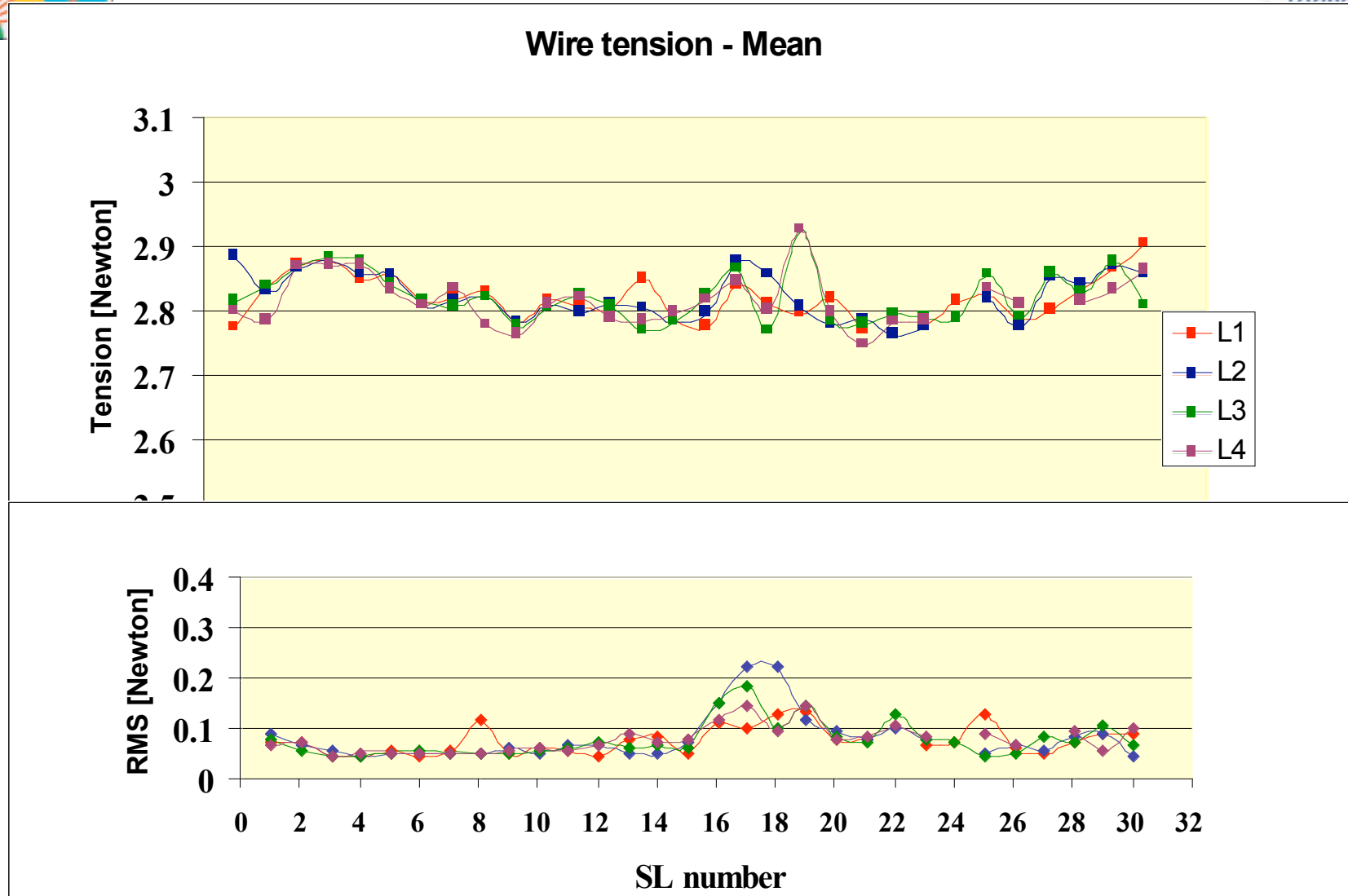
- **April 05 4 chambers to CERN (wheel YB+2 completed)**
- **May 05 4 chambers to CERN (wheel YB+1 completed)**
- **June 05 3 chambers to CERN (3 chambers for YB0)**
- **July 05 4 chambers to CERN**
- **September 05 4 Chambers to CERN**



# Sample of MB4 QC results

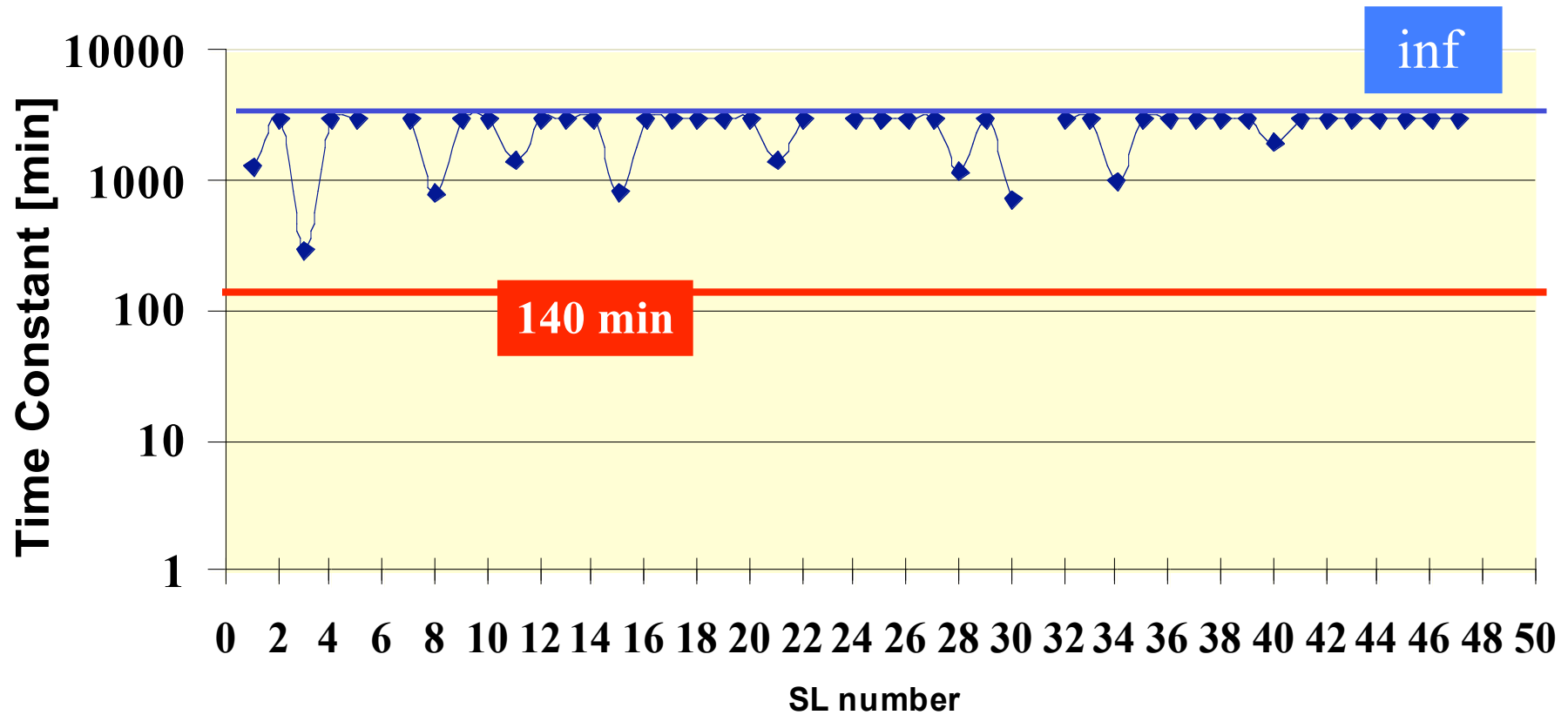


# Quality Control - Wire Tension





# Quality Control -Gas tightness

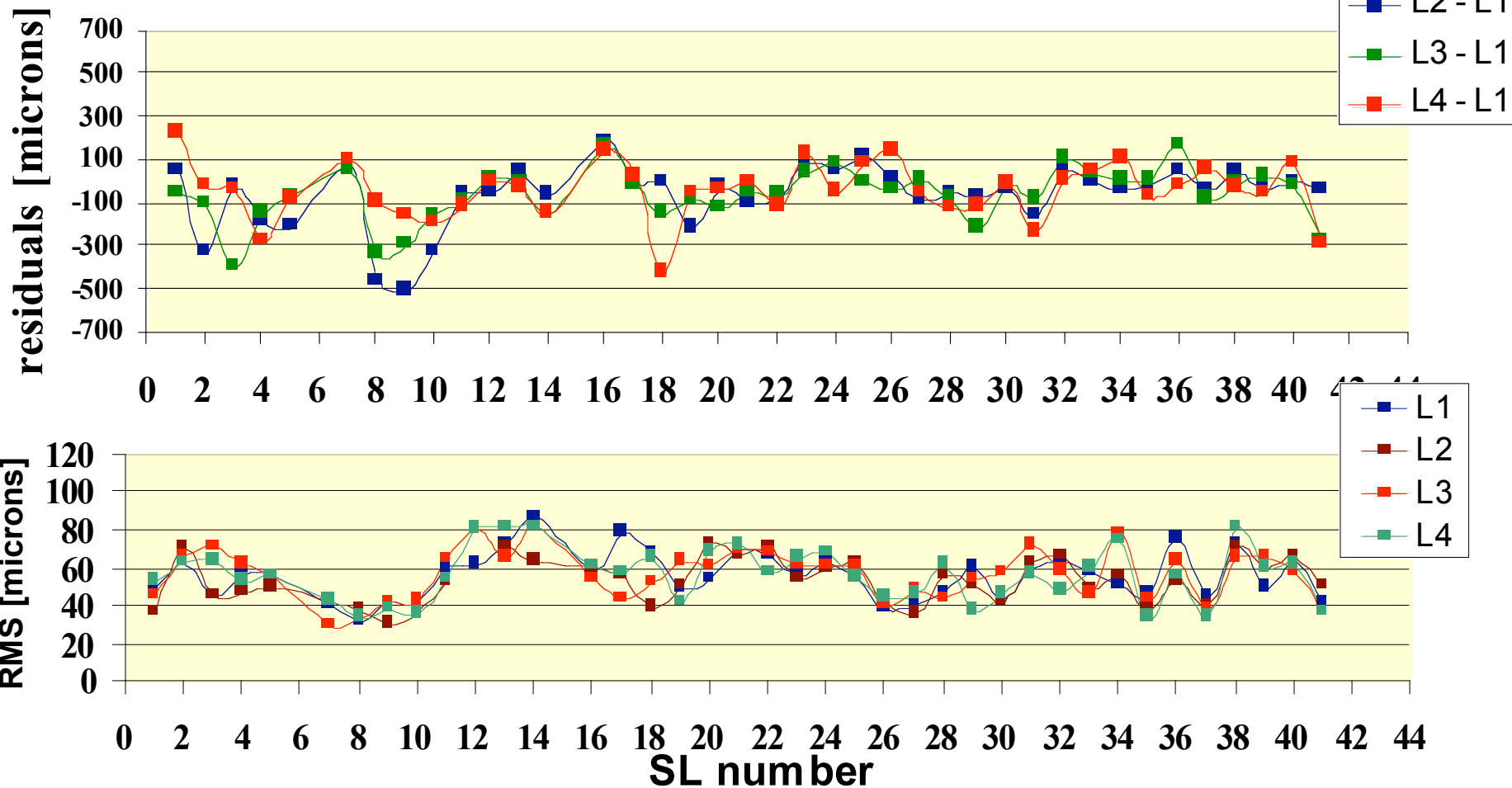




# Quality Control - Wire Position CCD

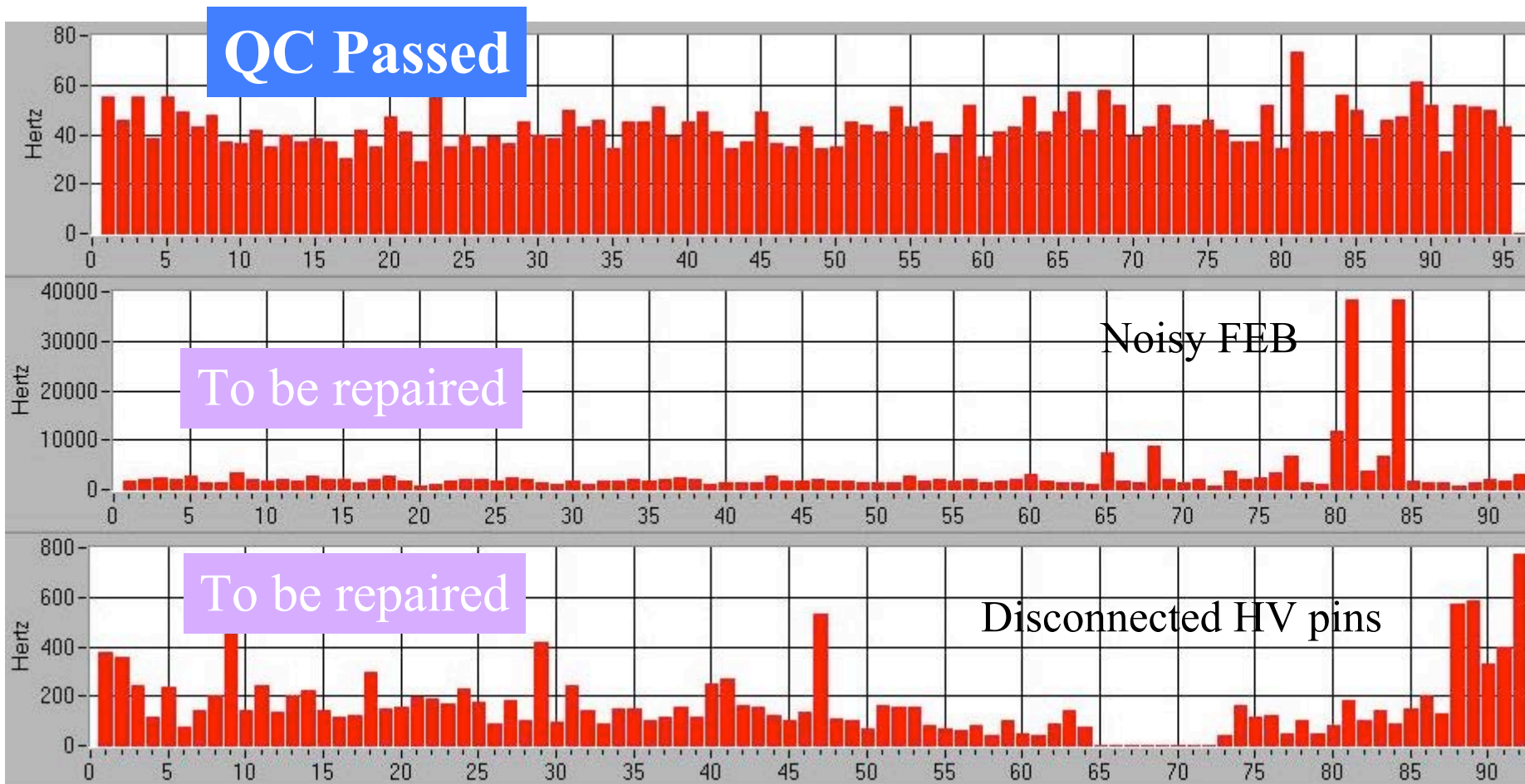


## Wire Position HV residuals - Mean





# Quality Control - Noise in GAS

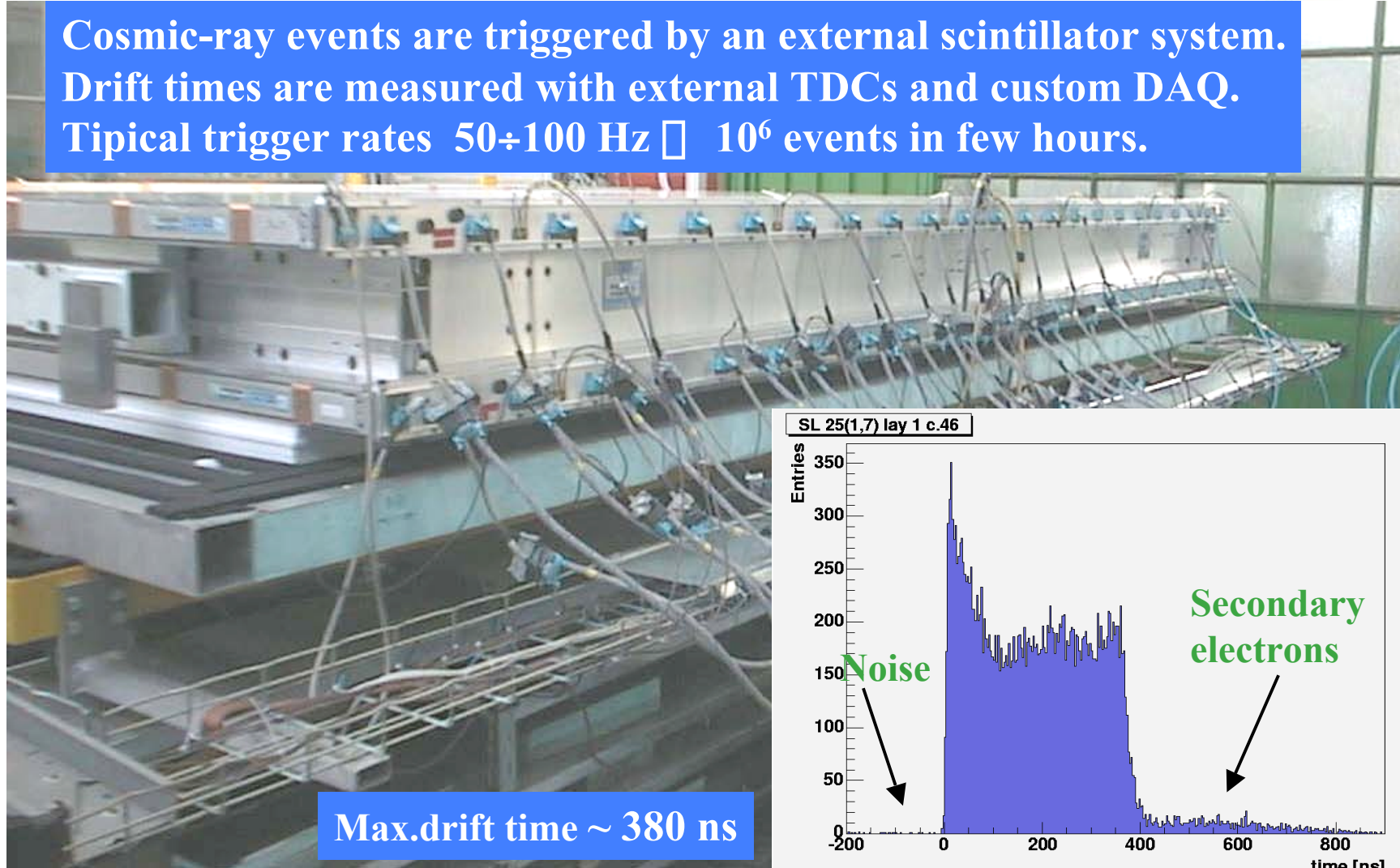




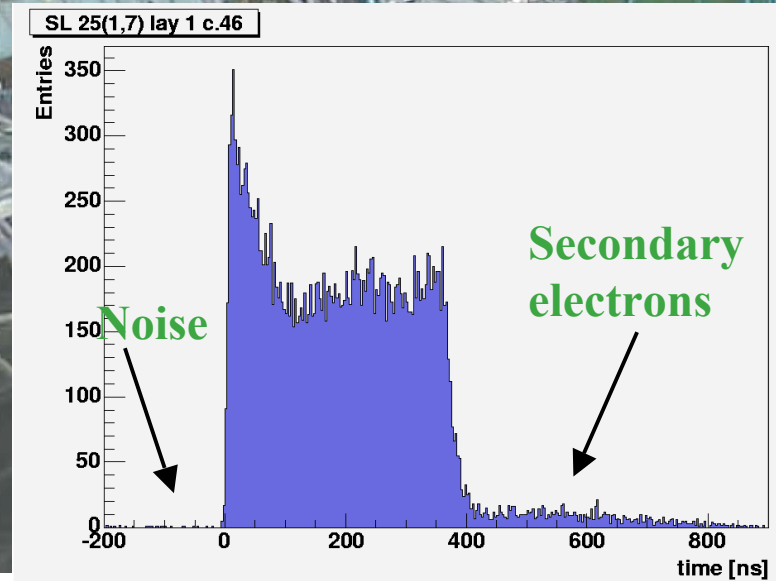
# Quality Control – Cosmic tests



Cosmic-ray events are triggered by an external scintillator system. Drift times are measured with external TDCs and custom DAQ. Typical trigger rates  $50\div 100$  Hz  $\square$   $10^6$  events in few hours.

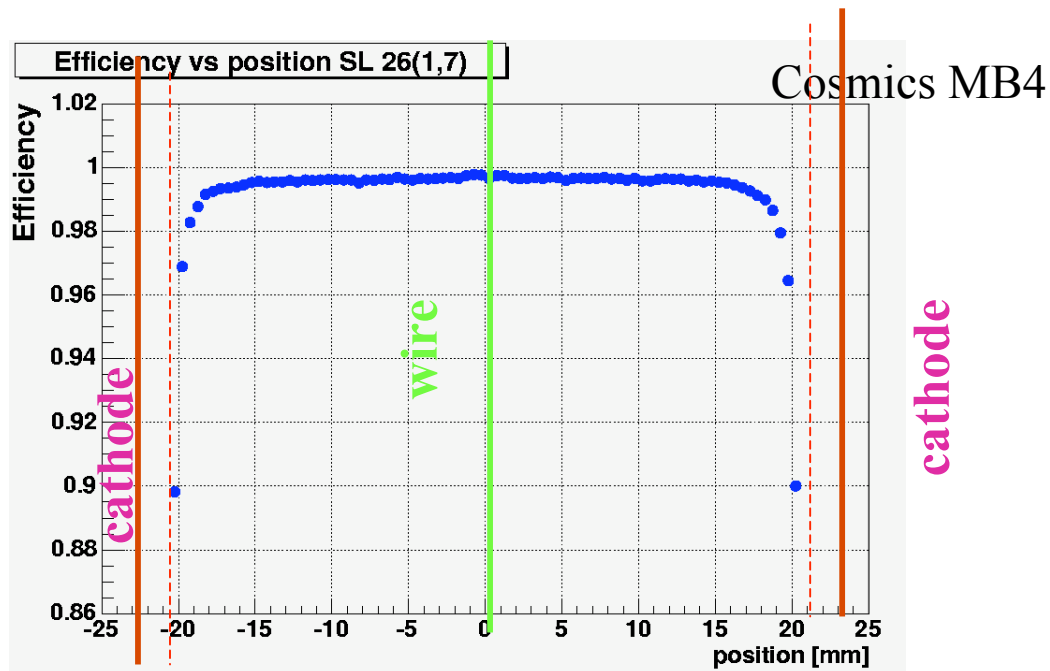


Max.drift time  $\sim 380$  ns



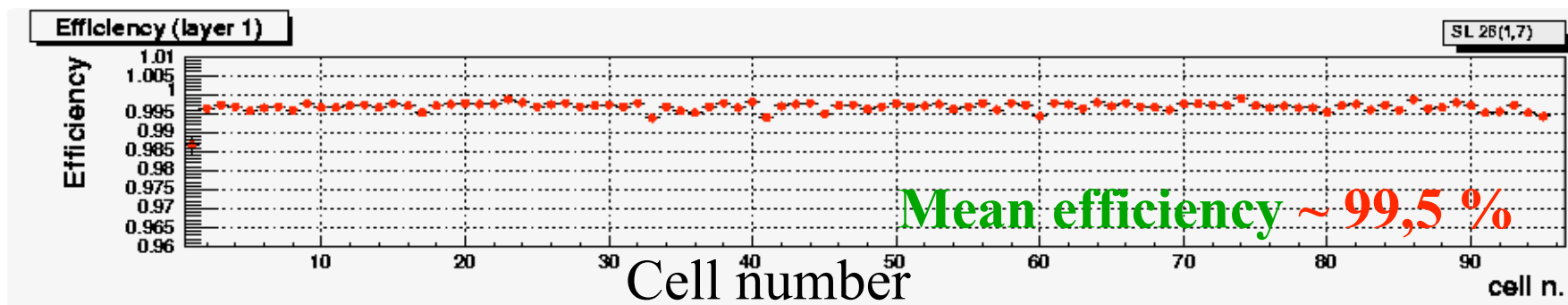


# Cell detection efficiency



$$\epsilon_{\text{cell}}(\mathbf{x}) = \frac{N_{\text{cell}}^{\text{found}}}{N_{\text{cell}}^{\text{expected}}(\mathbf{x})}$$

Detection efficiency in the active region > 99 %



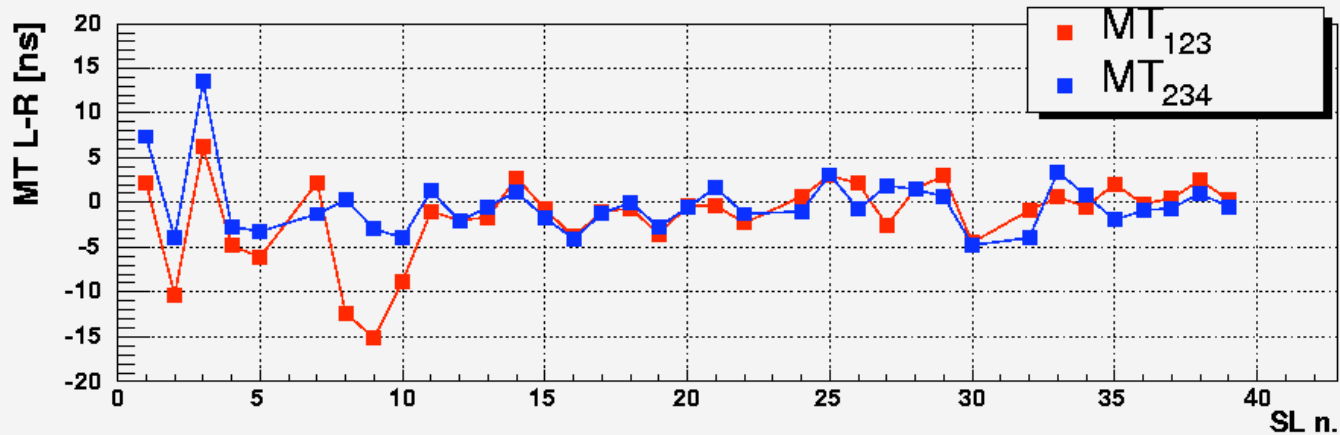




# Layer relative alignment

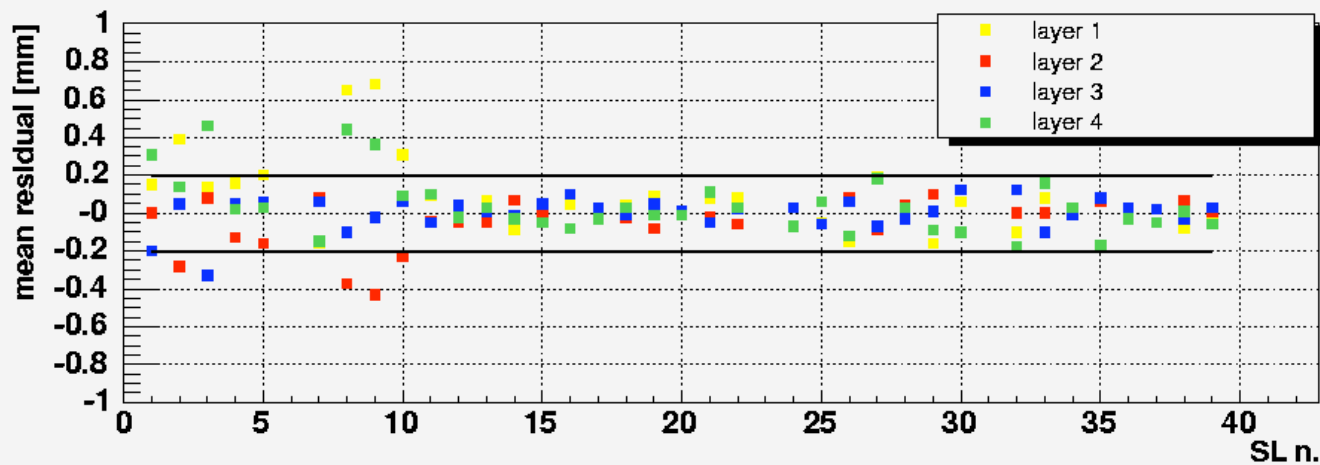


cosmlcs MB4



Indication of relatively large disalignment effects for SL n. 10  
...

cosmlcs MB4



... confirmed by the mean layer residuals



# Torino Production and QC Data Base



<http://tok17w2.to.infn.it/mb4adm>

Address <http://localhost/mb4dev/> Go Links


## CMS Muon System in Torino

Welcome To the MB4 Construction Management System

Click on a name of a Wheel to find out information about installed Chambers.

Click on one of the left items to navigate into assembled Chambers, SuperLayers, Covers and Material Store.

Wheel -2Wheel -1Wheel 0Wheel +1Wheel +2



### MB4 Assembly

- [MB4 Home](#)
- [Chambers](#)
- [SuperLayers](#)
- [Covers](#)
- [Store](#)



# Material Procurement for MB4 production



Aachen Wire Machine transported to Torino and ready to produce wires (with thanks to the Aachen group for the close collaboration)

<b>FE 16</b>	<b>196</b>
<b>Feedthrough16</b>	<b>70</b>
<b>HVC16</b>	<b>174</b>
<b>HVB16</b>	<b>936</b>
<b>FE cover MB4(1-7)</b>	<b>3</b>
<b>C profiles</b>	<b>20</b>
<b>Gas stoppers</b>	<b>26</b>
<b>Corner Blocks</b>	<b>16</b>
<b>Columns</b>	<b>16</b>

## Crimping Blocks:

**39SLx800CB = 32000 CB**

**2600 in Torino**

**30000 missing**

## Wire:

**39 SL = 16000 wires = 40 Km**

**received 25 Km**

**+ wires 1.5 Km**

**missing 14 Km**



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