Chamber Production Status @ Aachen

Status of 14.03.2005

full production (incl. spares) = 214 SL

Production Step	**No. of SL**	Remarks
Mechanically finished	**204 SL**	Contains 2 spare feet-SL without HV+FE assembly.
Fully assembled with HV + FE	**173 SL**	Limited by availability of HVB.
Fully tested SL	**171 SL**	2 SL are used for system tests.
HVB available for	0 24 SL → **197 SL**	New HVB_v5 ISR HVB_v1
Other materials available for	**184 SL**	Wire bunches for 1 SL missing
Chambers completed	**59**	
Chambers to be glued	**1**	Based on available, tested SL

Chambers at CERN = 43 MB1 + 9 Feet (Last shipment 8 chambers 03.12.2004)

To be done: 10 chambers **or** 10 SL

Material Status

As a reminder. Everything is known to experts and is in progress.

Mechanical parts:

Item	Needed Quantity
HV contacts for cathodes WITH pin	1550
Contact springs WITHOUT pin connecting to strips	60

HV assembly parts → next page

FE assembly parts → next page

Material Need for HV

Item	Quantity needed for 214 SL	No.of SL possible / all	Requested spare parts**
HVB-16	Available 190+100	22 / 51	:-)
JL7 white	232	22 / 51	10
JL7 yellow	212	28 / 51	10
DC4 white	572	34 / 51	15
DC4 yellow	972	28 / 51	20
DC5 white	89	21 / 51	5
DC6 white	24	27 / 51	2
DC6 yellow	150	36 / 51	5
DC7 yellow	29	22 / 51	1
Wire bunch phi	23	12 / 34	1
Wire bunch theta	7	9 / 17	1
Ground connector	42	30 / 51	5
Interlock	20	41 / 51	2
Plastic clambs	204	38 / 51	15

Numbers are based on inventory Dec.2004

Requested spare parts include potentially needed items for chamber repair at the ISR (based on repair experience so far)

Cables and wire bunches are expected by end of March.

Material Need for FE

Item	Quantity needed for 214 SL	No.of SL possible / all	Requested spare parts**
FEB-16	160	14 / 42	15
FEB-20	20	20 / 42	3
HVC-16	138	12 / 42	15
HVC-20	-	42 / 42	-
LV feed-through	11	11 / 30	2
Slow control bus bar phi Slow control bus bar theta	10 6	10 / 28 6 / 14	1 1
I2C Predecode bus phi I2C Predecode bus theta	2* 8*	2 / 28 8 / 14	1 1
Signal feed-through 4-ch. Signal feed-through 16-ch.	14 190	14 / 30 15 / 30	2 10
Slow control feed-through	15	15 / 30	2
TP feed-through standard TP feed-through special	70 6	24 / 30 6 / 10	20 3
Cu-protection slow control	25*	25 / 30	1
Ground contacts FE-cover	530	0 / 22	

Material request based on inventory 06.12.04
Including delivery of 06.12.04
*Numbers should be verified

Under way to Aachen

Overview HVB in SL

Different HVB versions are installed in MB1-chambers:

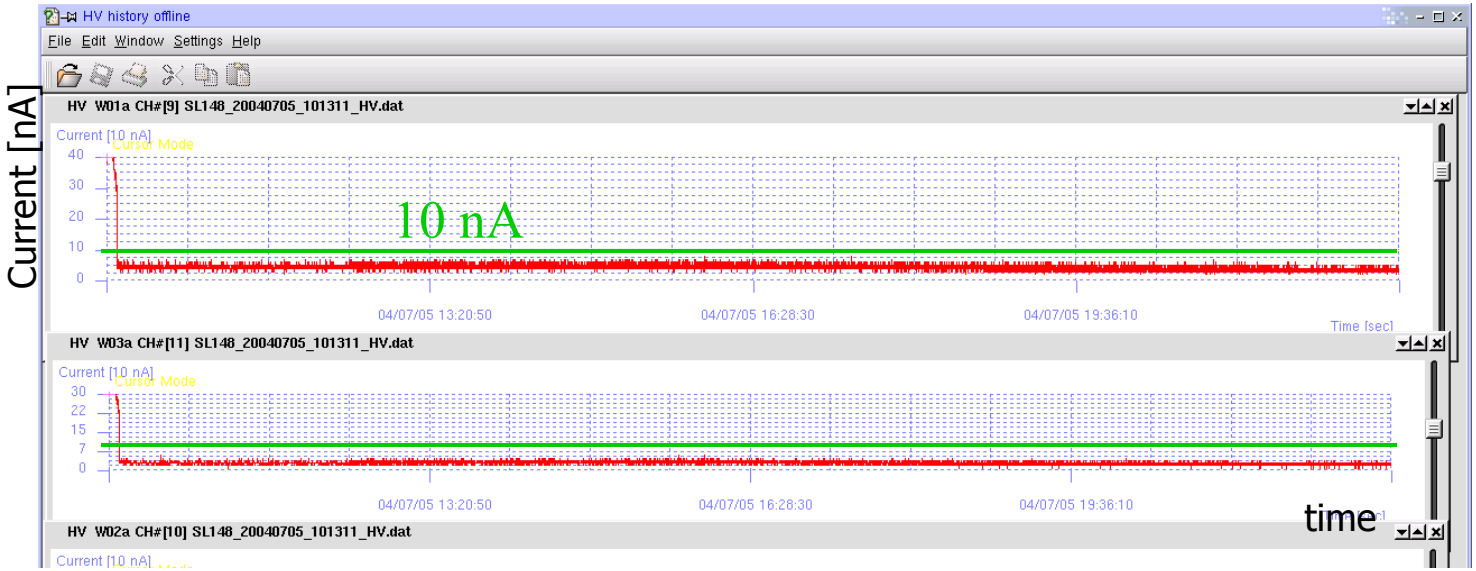
- Wheel YB+2: 10 MB1 + 3 MB4_feet are equipped with HVB-I_v2
- Wheel YB+1: all 9 MB1+z equipped with HVB_v5
  2 MB4_feet postponed
- Wheel xx: 2 Chimney chambers already with HVB_v5
  3 MB1 -z at Aachen equipped with HVB_v5

HVB-type	No. of SL already equipped	HVB still available for
Old HVB_v1	89 SL	24 SL
HVB-I_v2	36 SL	0 SL
HVB from new pre-production v5	8 SL (2 chimney + 2 test SL)	0 SL
New HVB_v5	32 SL (9 MB1@ISR + 3 MB1@AC)	0 SL

⇨ HVB exchange at ISR and assembly at production site has to be done by the same people = slower assembly speed.

HV Training for HVB_v5

- At Aachen 1 SL (SL 148) with new HVB (assembled at Aachen) stayed under HV for 50 days → no currents or other problems observed



Wire current monitoring for 2 wire-groups (out of 6) after 46 days under HV

At beginning increased noise

- 2 chimney chambers + 5 MB1 with HVB available since Nov.2004, have been under HV for ~2-3 weeks until Feb.2005
- 4 MB1 chambers (MB1P19, MB1P25, MB1P35, MB1P37) HVB exchanged in Feb.2005 and chambers are under HV since ~05.02.2005

→ Details see talk Jesus/Alberto

Last ISR Activity – February 2005

Period 01.-11.02.2005, 2 technicians (WT, SS) + 2 physicists (OT, KH)

- 5 MB1 for YB+1 done in November 2004. Four are certified by J.Puerta.
- In Feb.05 four MB1 exchanged HVB_v1 with HVB_v5 (assembled at China, protective tubes assembled at Aachen). No HVB for feet-chambers.

MB1P35

* No HV on 1 wire pin in HV-connector (phi2) problem in HVB or HV installation(?)
* Low efficiency in 8 cells (theta) → exchanged FEB, OK

MB1P25

* 2 very noisy cells (theta, L3C16, L3C44) → exchanged 2 FEB+HVC, OK
* Bad cathode contact (theta) → exchanged both contacts, also present in AC
* With old HVB HV-problem in phi1 L3L4 → not present with new HVB
* Pulse width 2.5 V with ~40% efficiency (phi2) → nothing done

MB1P37

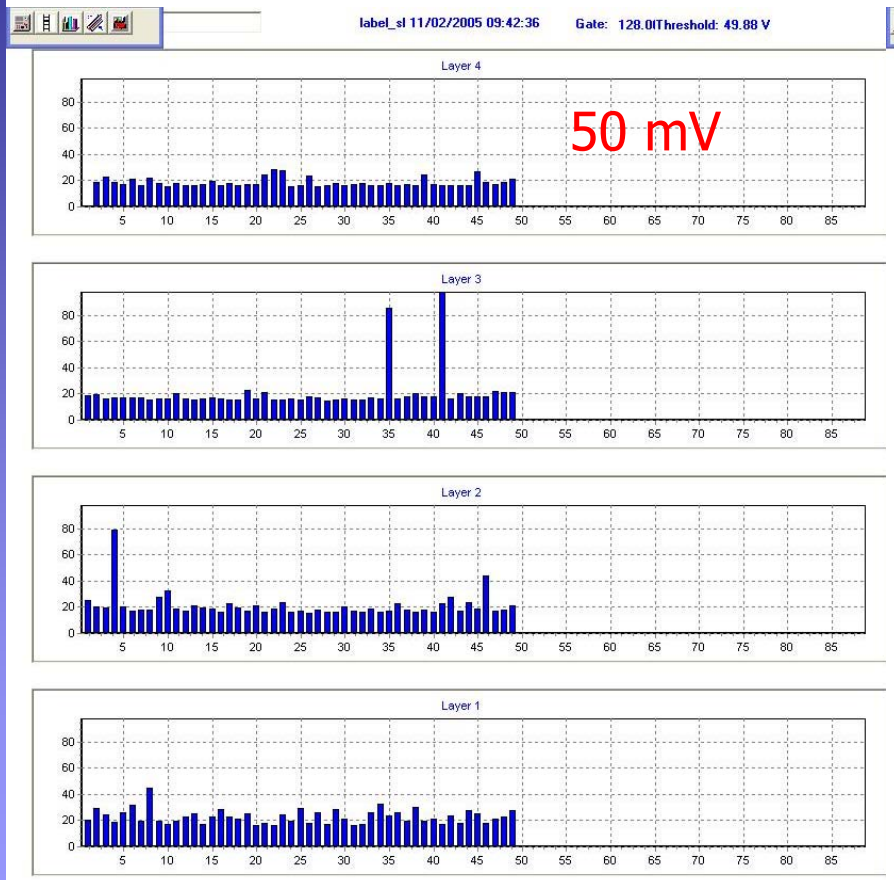
* With old HVB HV-problem in phi2 L3L4 → not present with new HVB
* Noise (theta) → FEB exchanged → after that asymmetric gas distribution

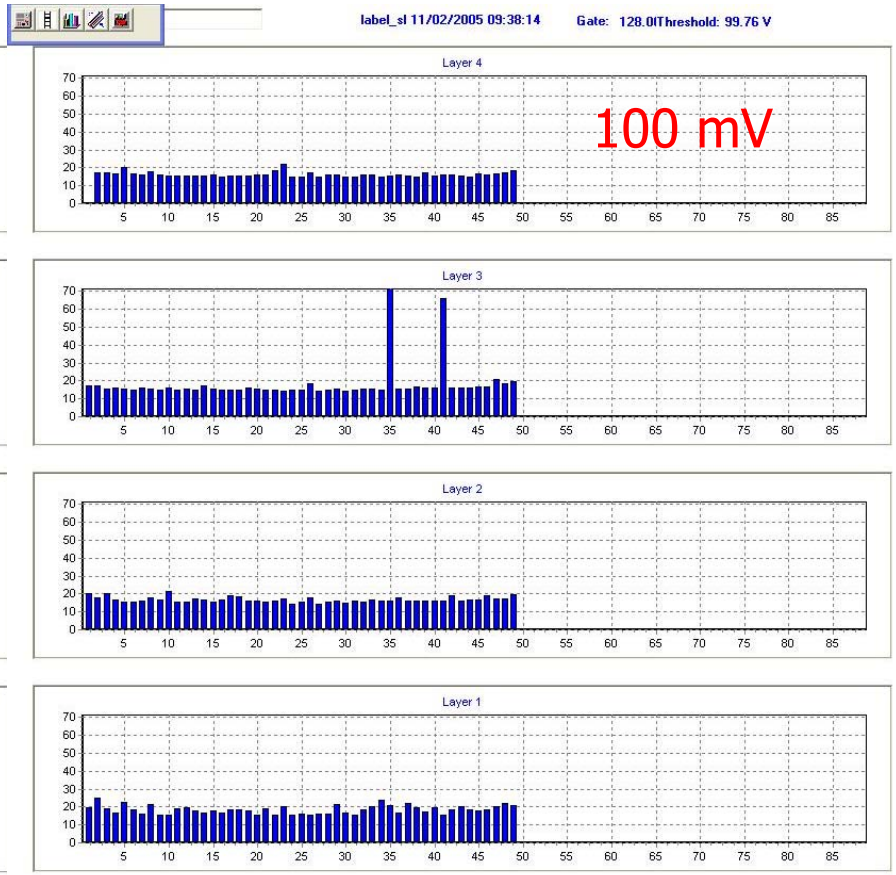
MB1P19

* Many noisy cells in theta, phi1 → OK after HV-training
* 1 cell with HV-problems after HVB exchange (phi1, L3C13) → disconnected

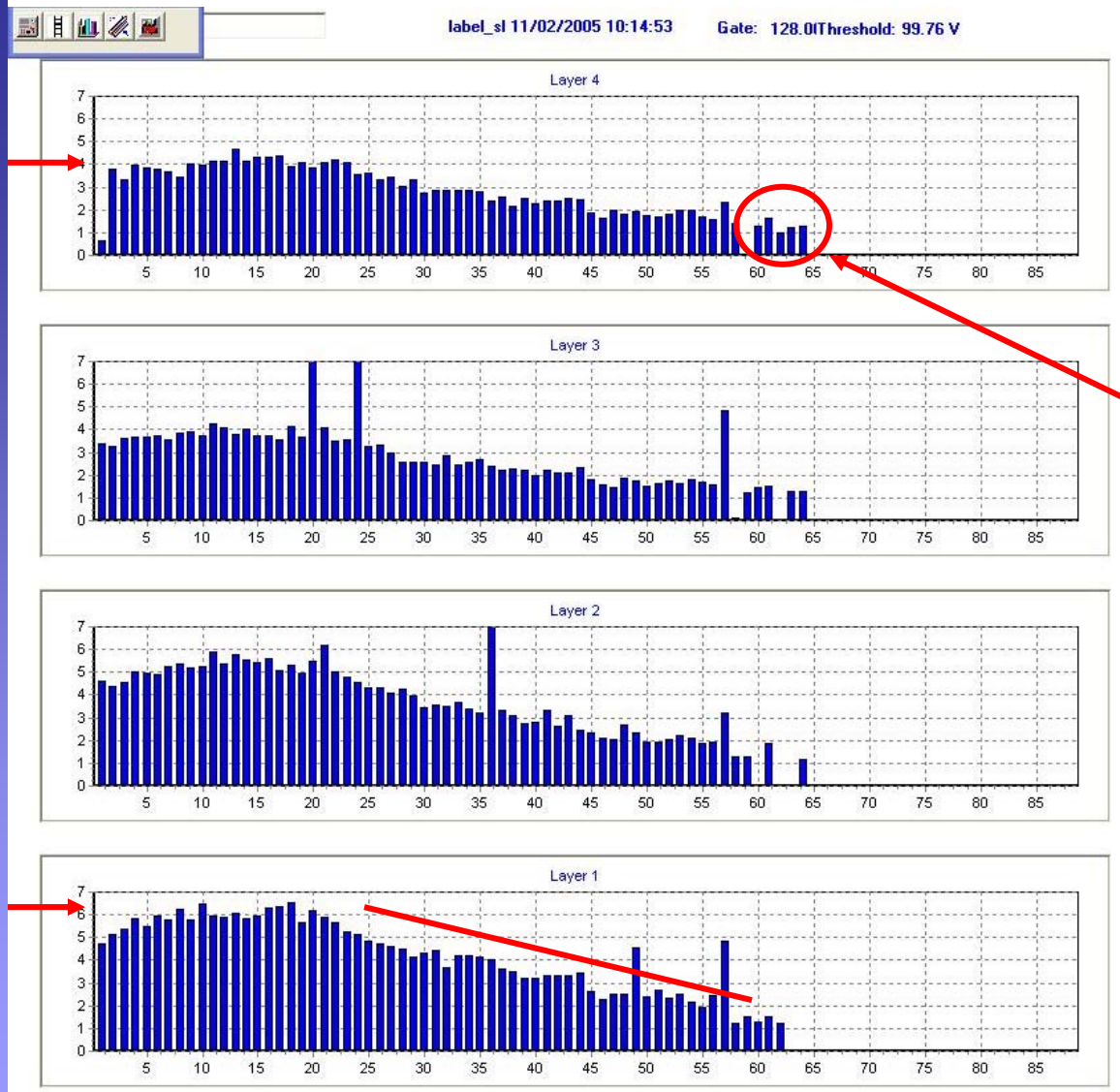
Noise

Often noisy cells disappear when threshold is raised to 50 mV (instead of 15 mV nominal). But sometimes independent on threshold = real noise.





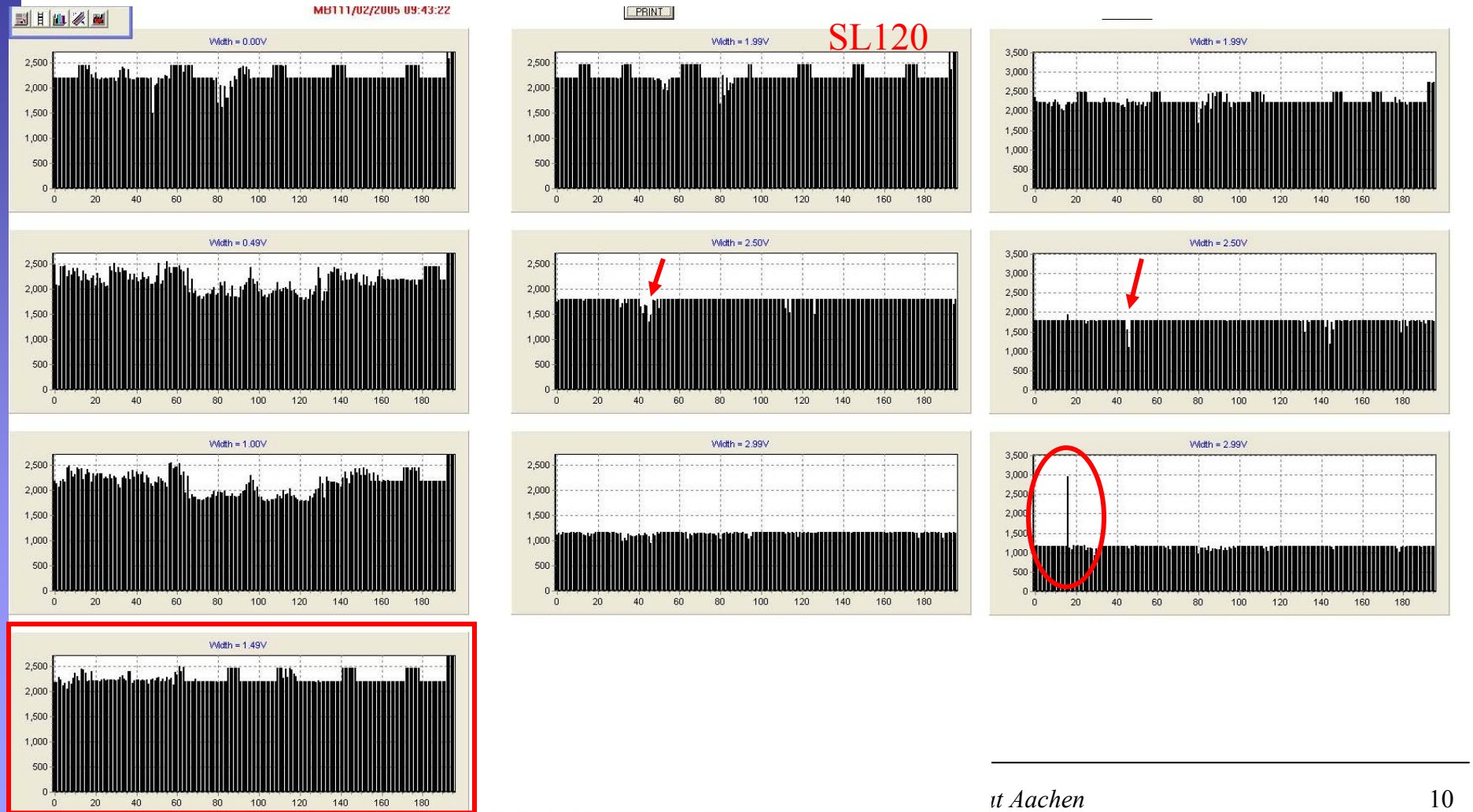
Gas Distribution



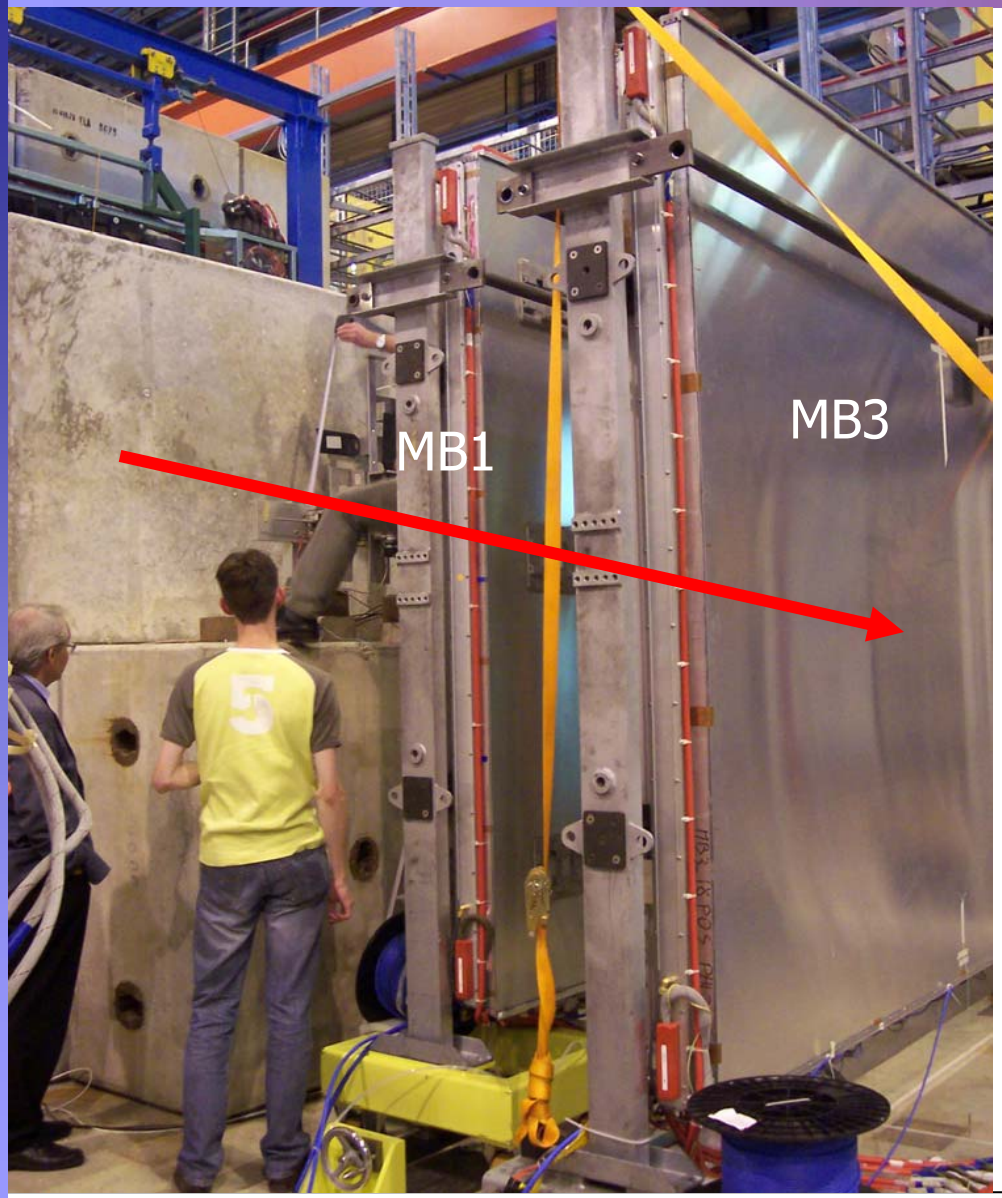
- Plot: more noise in layer 1 (bottom) than layer 4 (top)
- Strange behaviour along layer SL108 theta
- Hits in non-existant cells

Pulse Width

- 2 plots showing that sometimes #entries for a certain pulse width is constant and sometimes it fluctuates.
- Last 4 wires always show more entries than others



Testbeam Analysis with ORCA



Phys.Inst.IIIA analysis team:

M. Brodeck, M. Bontenackels, H. Fesefeldt, Th. Hebbker, K. Hoepfner

Our main interest:

- Experience with ORCA
- Muon data
- Performance of MB1 in comparison to cosmic tests
- Combined tracking for two chambers (MB1 and MB3)

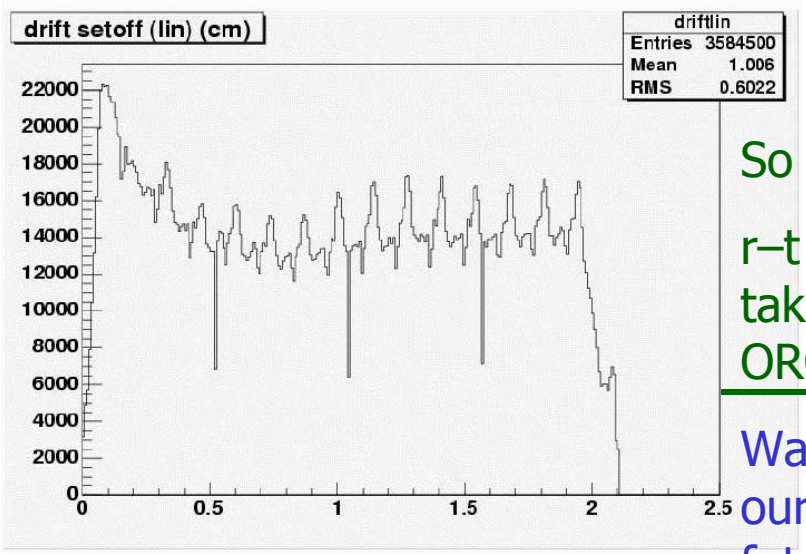
So far, used runs which were identified as "good" (see Mary-Cruz transparencies from Dec.2004). For example 2611 in the following plots.

First Step = Reading Data

- Tools: ORCA_8_7_1 with testbeam package (TestBeams/DTBXAnalysis, TestBeams/MBTBDataFormat), ORCA geometry for chambers

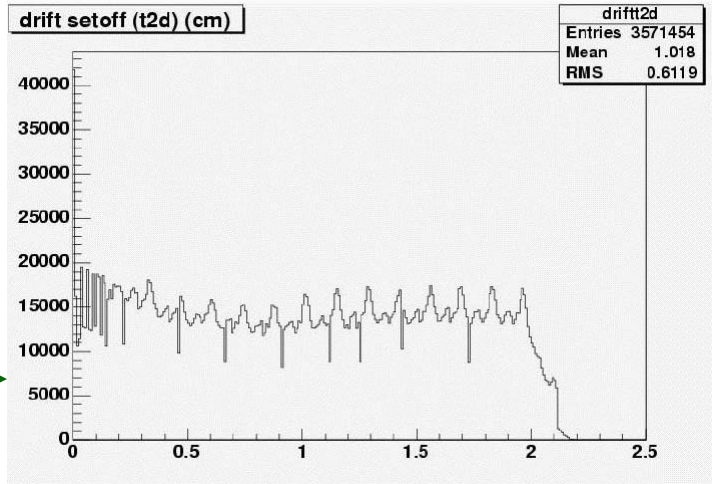
  With the right knowledge of needed packages → ORCA runs

  Testbeam data are read. Trackfit functions.



So far:

r–t relation taken from ORCA



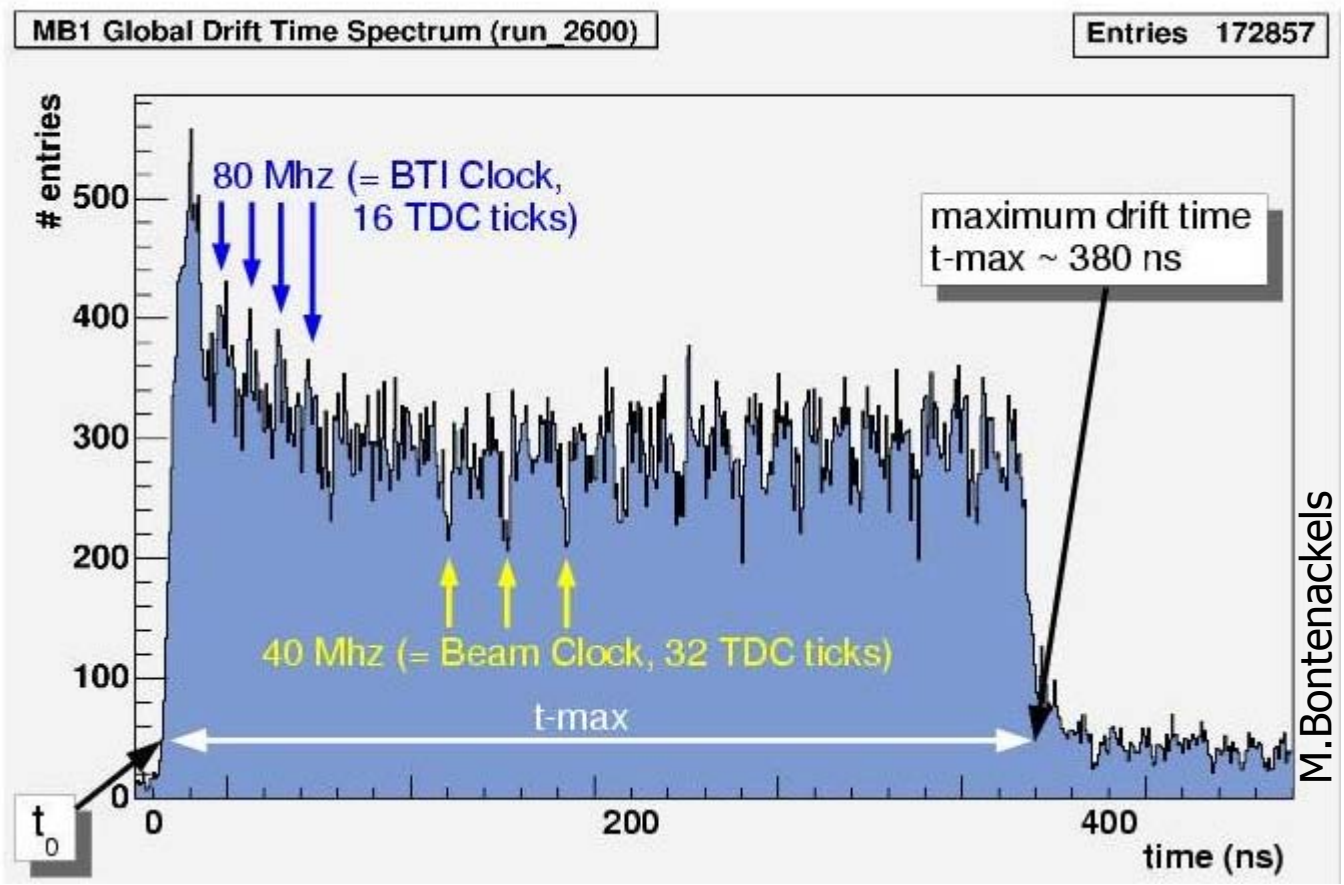
Want to try our own in near future

- Working on geometry for 2 chambers in testbeam arrangement, needs new xml-file (H. Fesefeldt)

⇨ TDC spectrum pattern, see next page

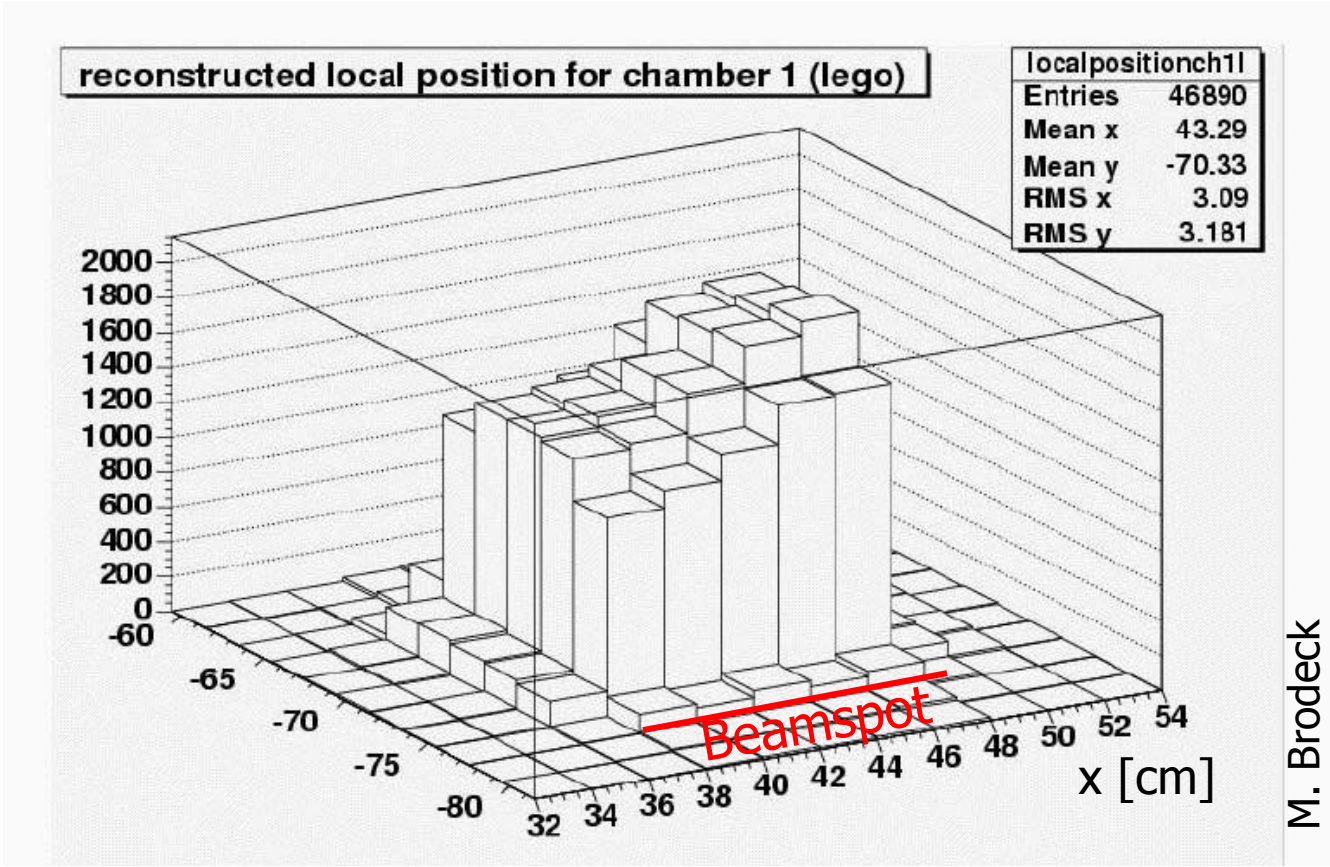
Beam Clock Pattern

- First seen in testbeam data 2003. (see M. Bontenackels talk March 2004)
- Effect confirmed by Matteo et al., under investigation. Anna Meneguzzo saw effect as well → no cross talk but time information is shifted.



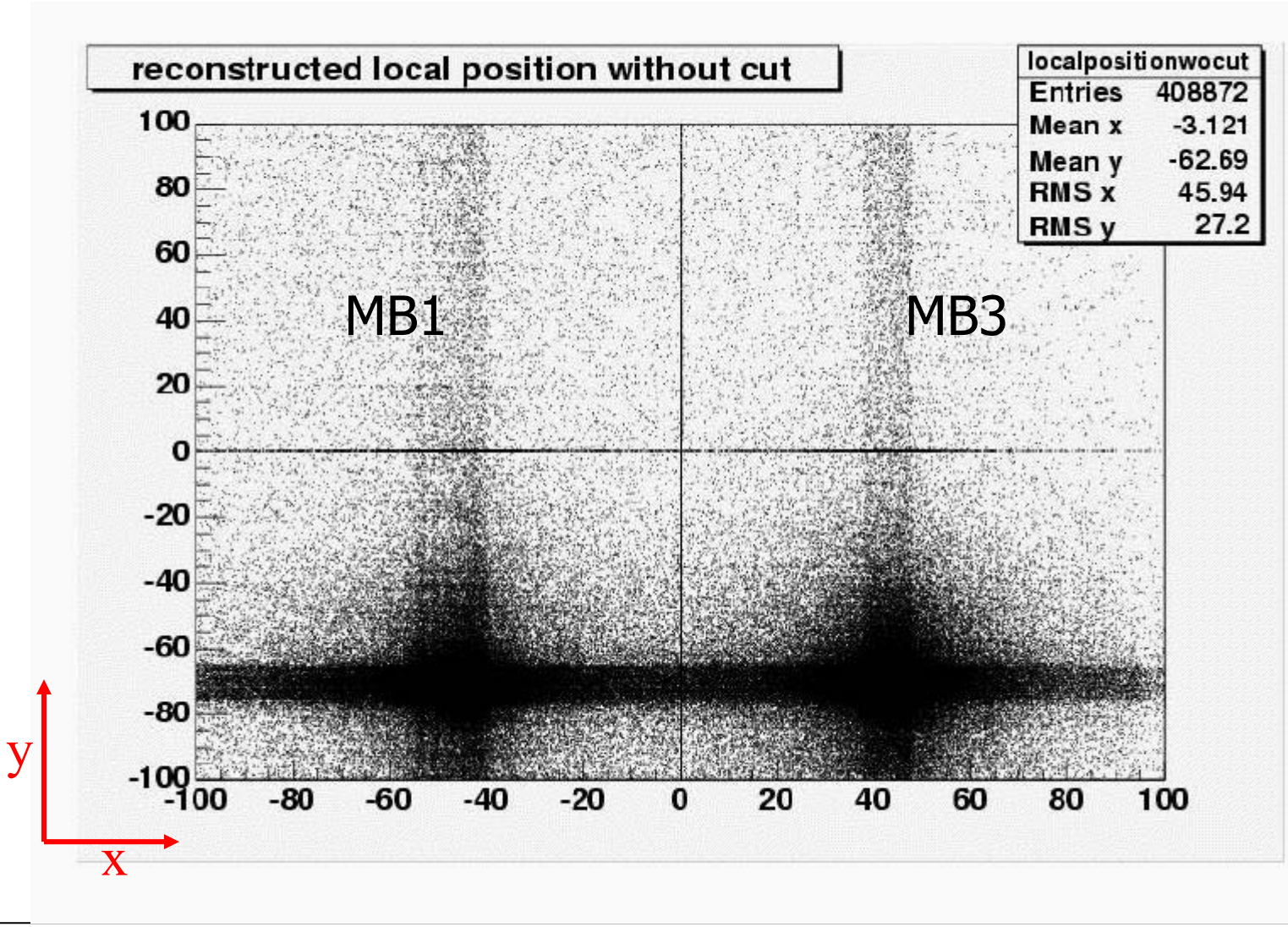
Second Step = Reconstruction of Local Position

- Tools: ORCA_8_7_1 with testbeam package (TestBeams/DTBXAnalysis, TestBeams/MBTBDataFormat)
- So far, geometry for single chamber from ORCA



Single chamber (MB1)

Local Position Before Cuts

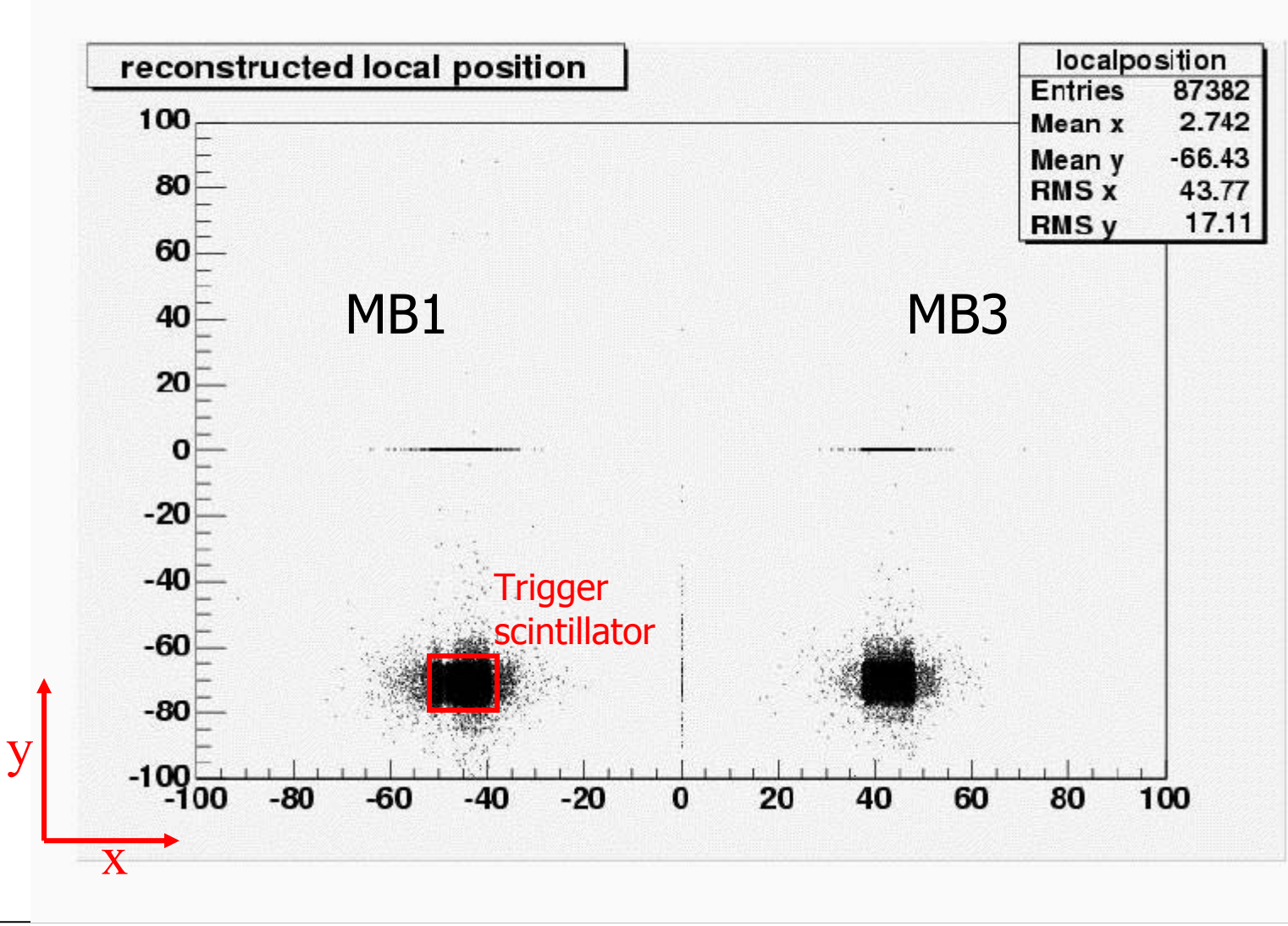


Hits outside beamspot largely related to badly reconstructed tracks.

If no.hits >>12 per chamber sometimes far too many tracks are reconstructed.

Single tracks ~60%

Local Position After Cuts



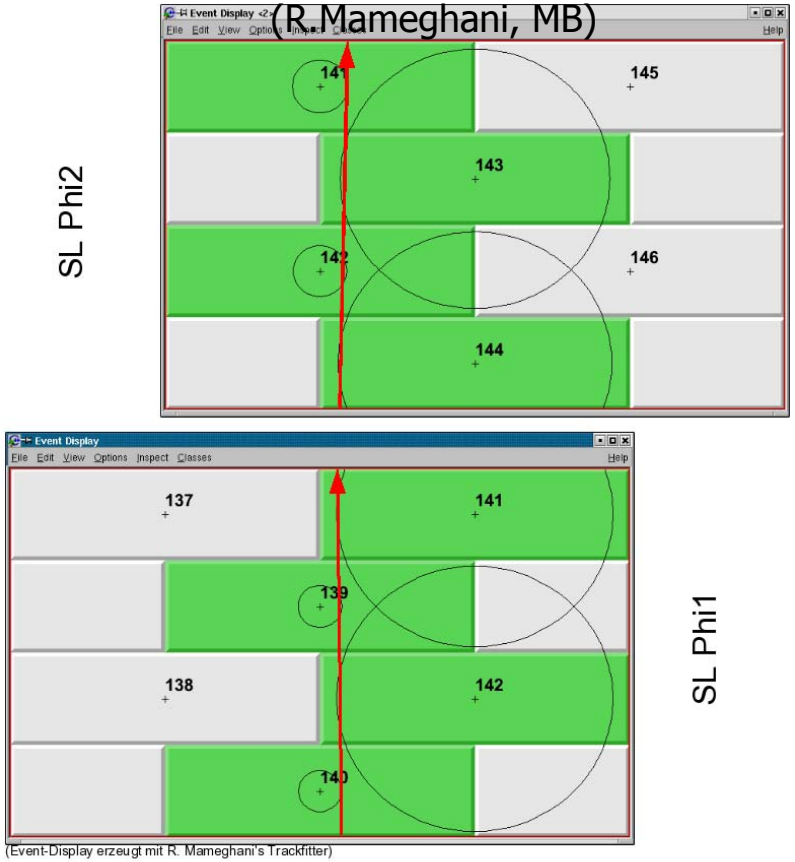
With single track cut.

Single tracks ~60%

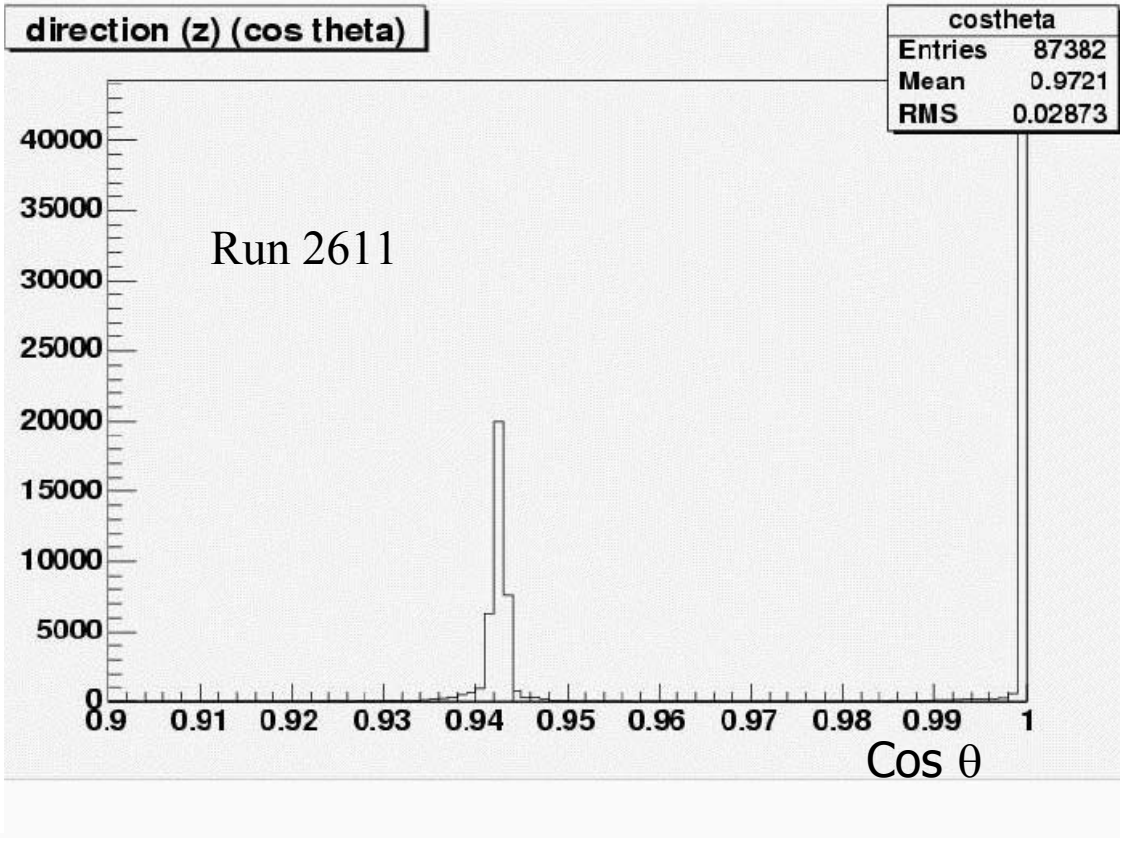
Track Angle

- Using ORCA trackfit, track segments in phi 1 and phi 2 are reconstructed and matched.

Aachen event display
(R.Mameghani, MB)



Reconstructed track angle is consistent with data taking conditions.



What's Next

- Work on r-t relation, t_0 determination & calibration.
- Implement features from Aachen stand-alone cosmics analysis software.

- Determine QC parameters (efficiencies, resolution, mean time analysis, etc.)
- Compare to the ones determined from cosmics data taking.

- Implement xml-file for two chamber geometry in testbeam arrangement.
- Study tracking.