

TRD alignment

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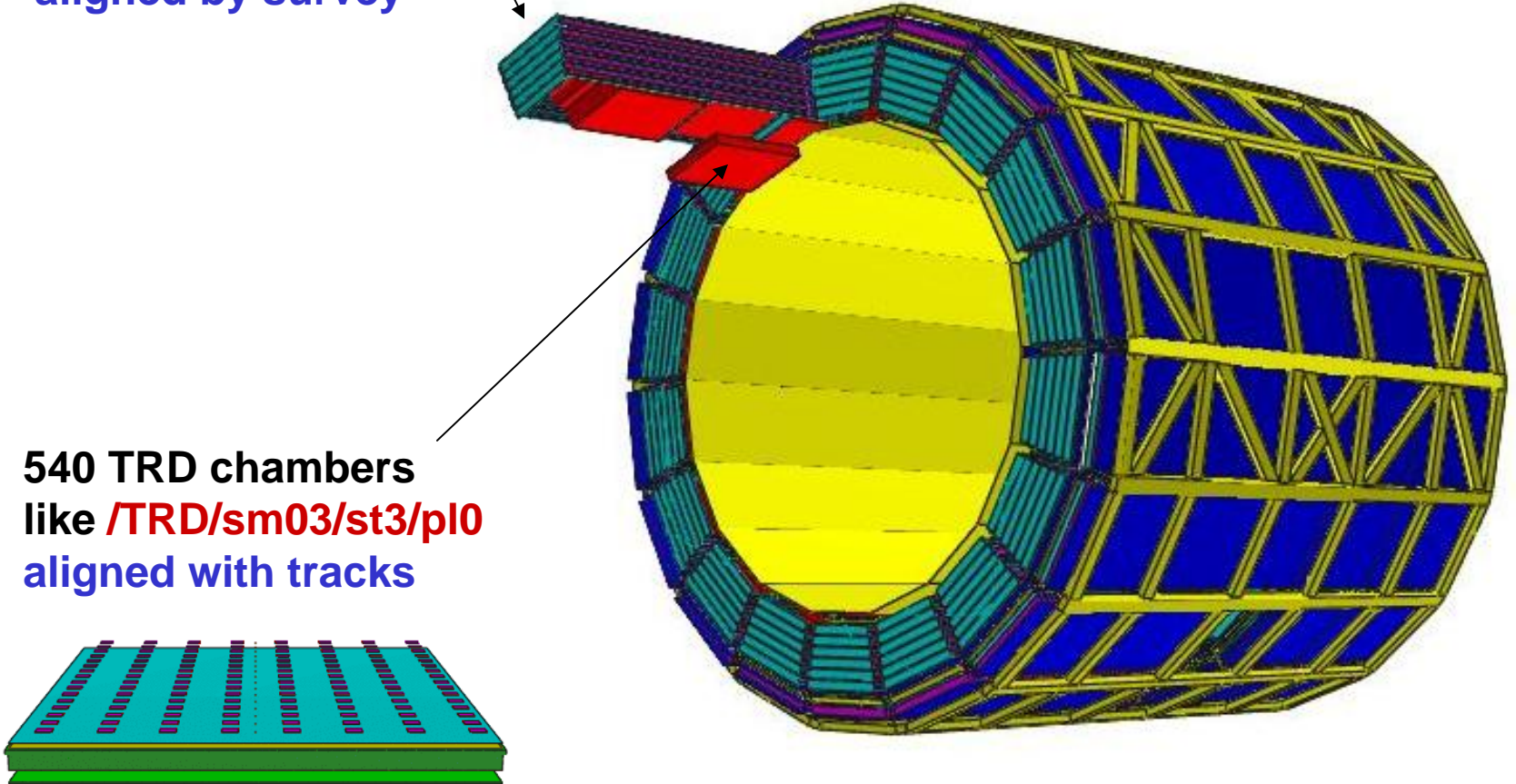
TRD status meeting, 7-Jun-2008

- 🌀 *intro*
- 🌀 *alignment with Münster cosmics*
- 🌀 *survey plans*

alignable objects in TRD

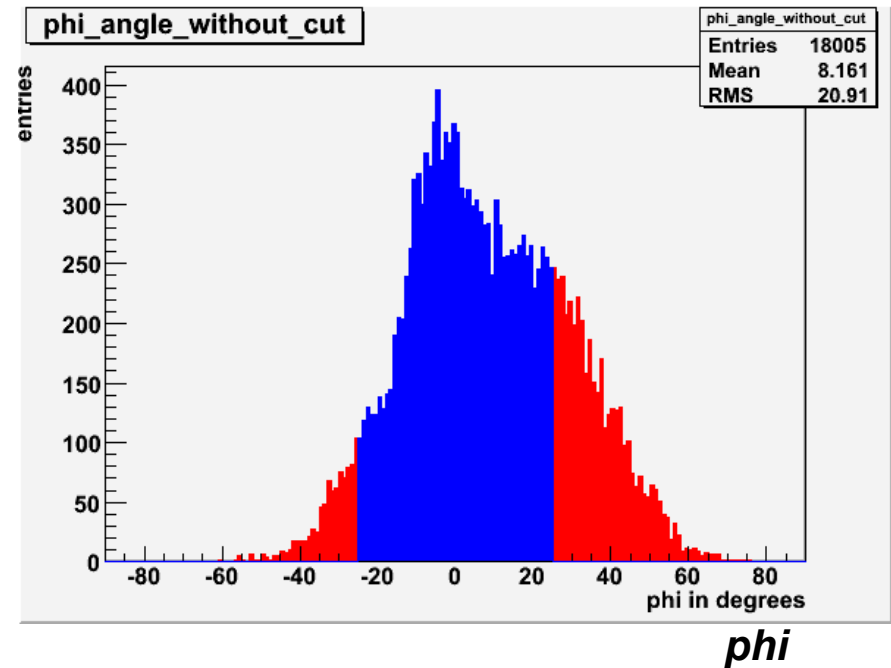
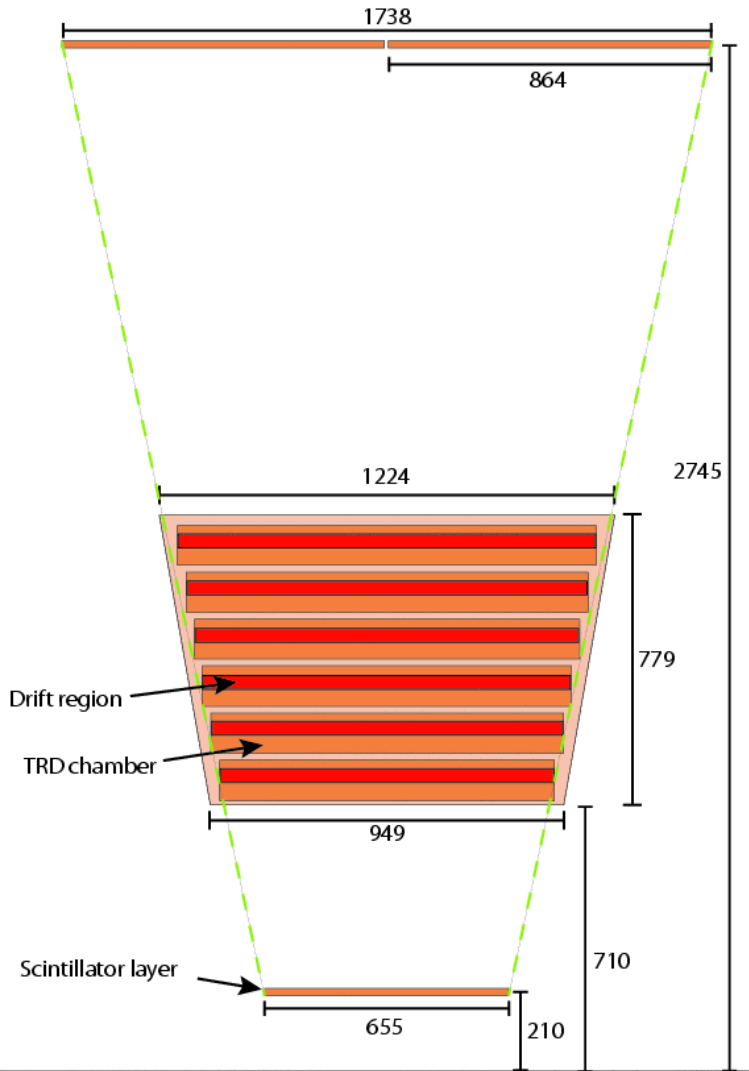
18 TRD supermodules
like **/TRD/sm03**
aligned by survey

540 TRD chambers
like **/TRD/sm03/st3/pl0**
aligned with tracks



Münster cosmics

cosmic trigger rate 100 Hz
1 M – 10 M events per SM
100 k – 1 M tracks per SM

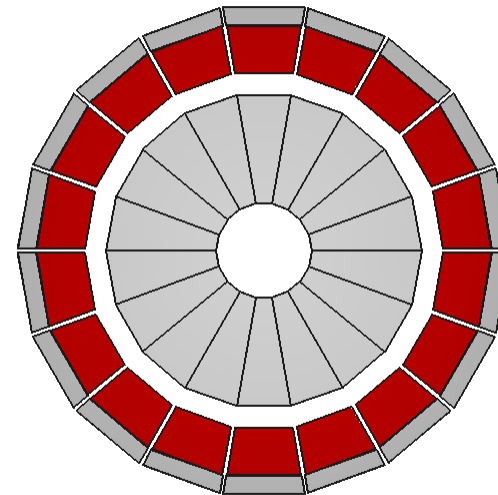


Bastian Bathen

Münster cosmics

| <i>supermodule</i> | <i>assembled</i> | <i>reassembled</i> | <i>inserted</i> | |
|--------------------|-------------------|--------------------|---------------------|------------------|
| SM1 | Heidelberg | --- | Nov(?) 2006 | Sector 8 |
| SM2 | Münster | --- | Jan 2008 (?) | Sector 0 |
| SM3 | Münster | Münster | | |
| SM4 | Münster | CERN | May 2008 | Sector 9 |
| SM5 | Münster | Münster | May 2008 | Sector 17 |

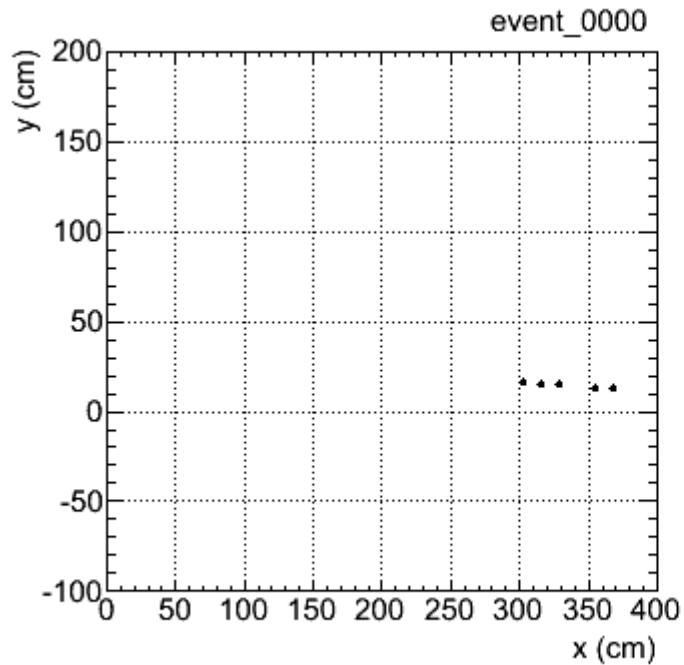
**in this talk: 5370 tracks in SM4
(now in sector 9)**



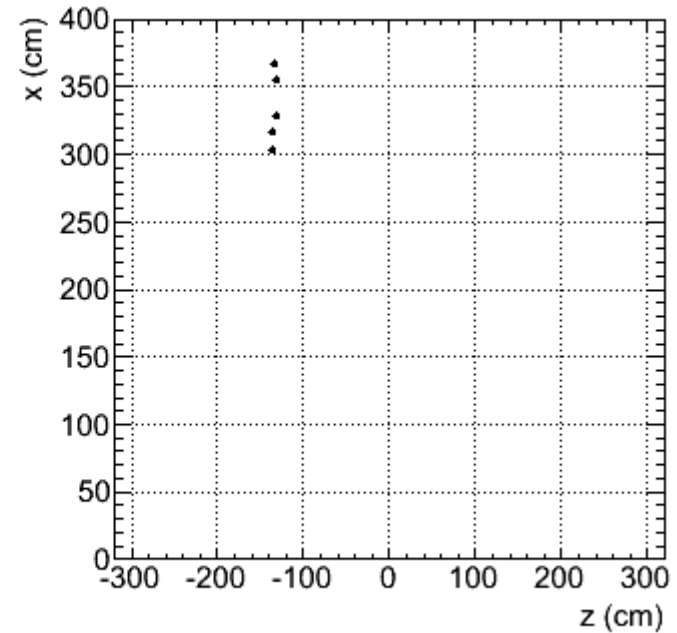
**btw. data looks
like coming
from sector 0**

Münster cosmics, SM4

ALICE pit view from A-side

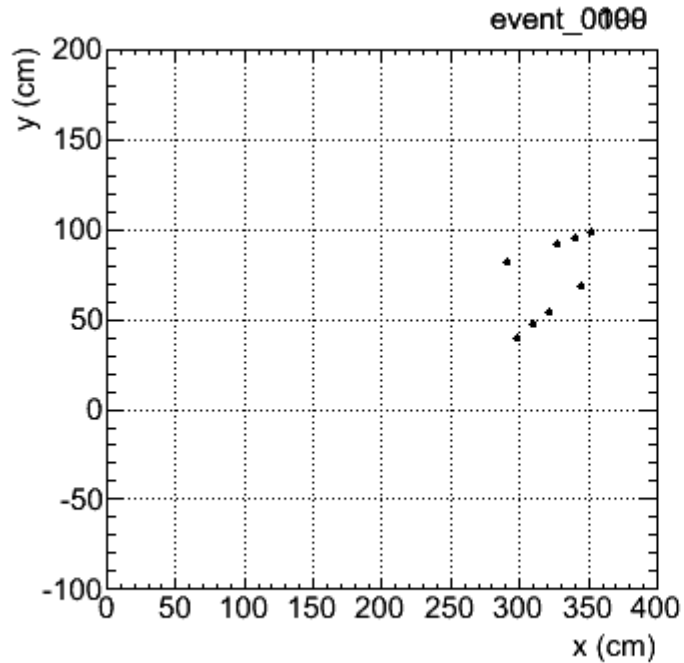


ALICE pit top view

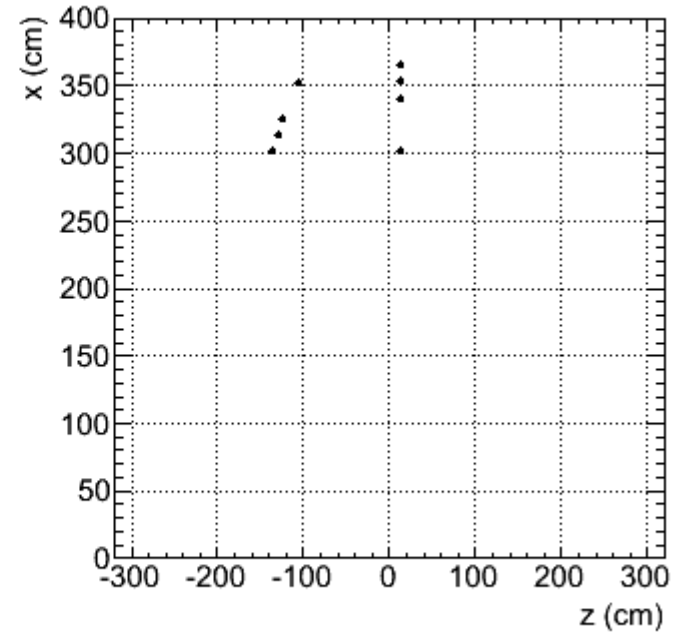


Münster cosmics, SM4

ALICE pit view from A-side

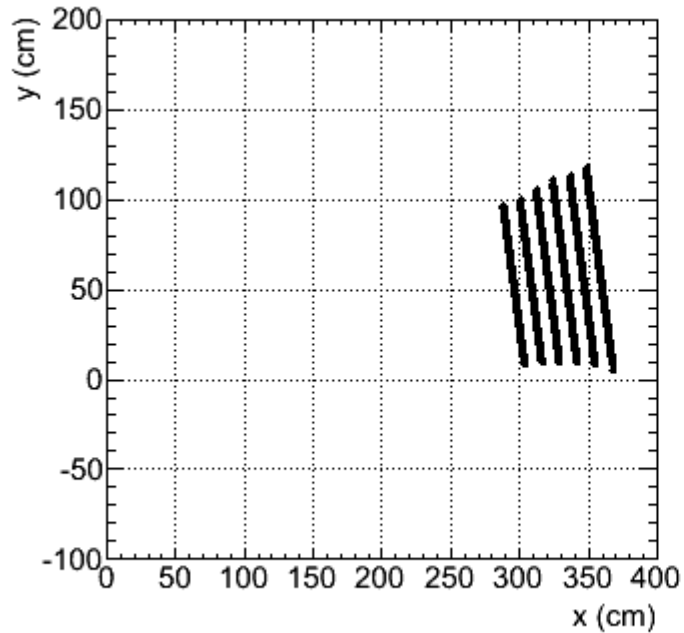


ALICE pit top view

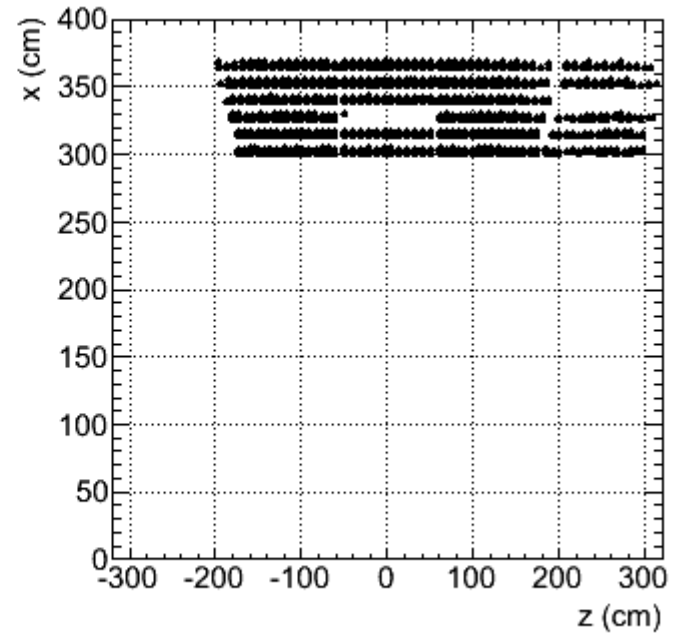


Münster cosmics, SM4

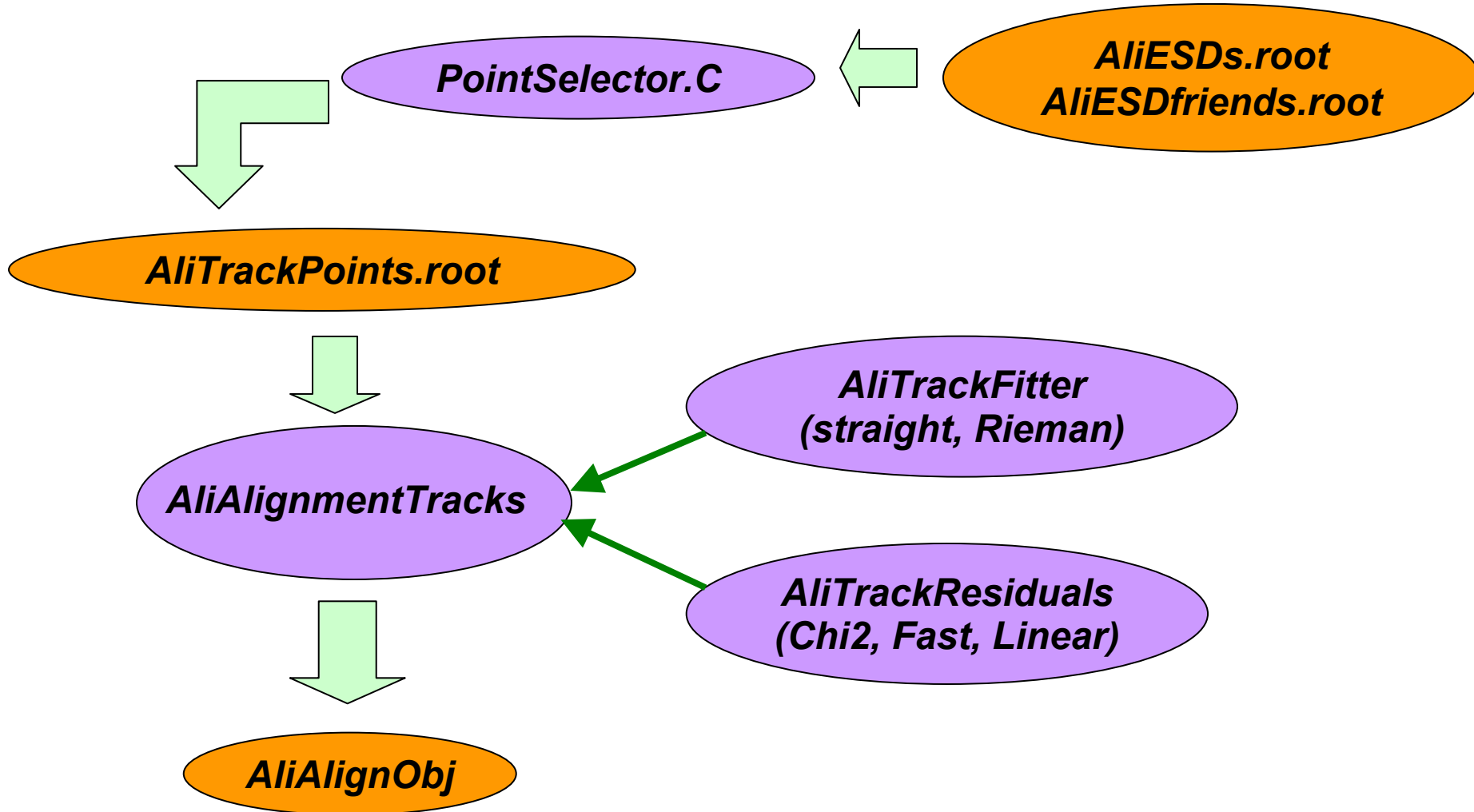
ALICE pit view from A-side



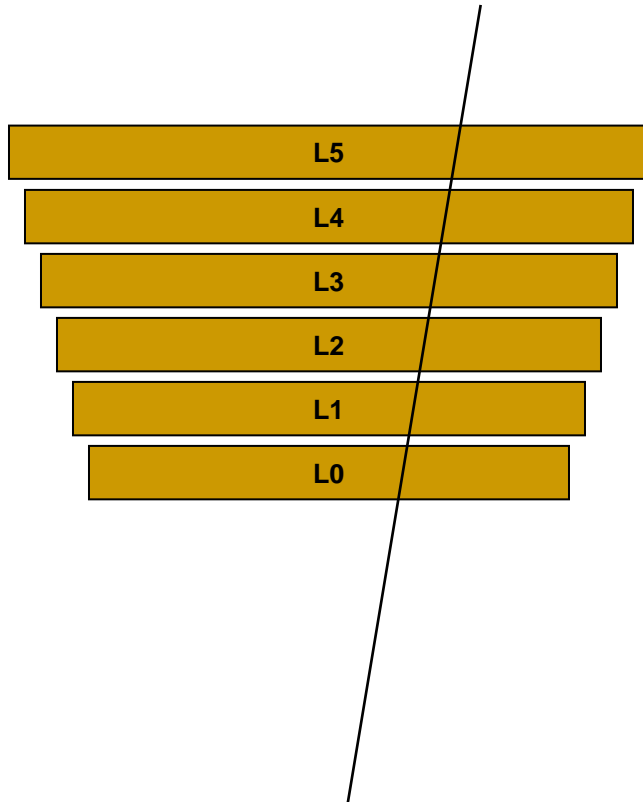
ALICE pit top view



alignment procedure with *AliAlignmentTracks*

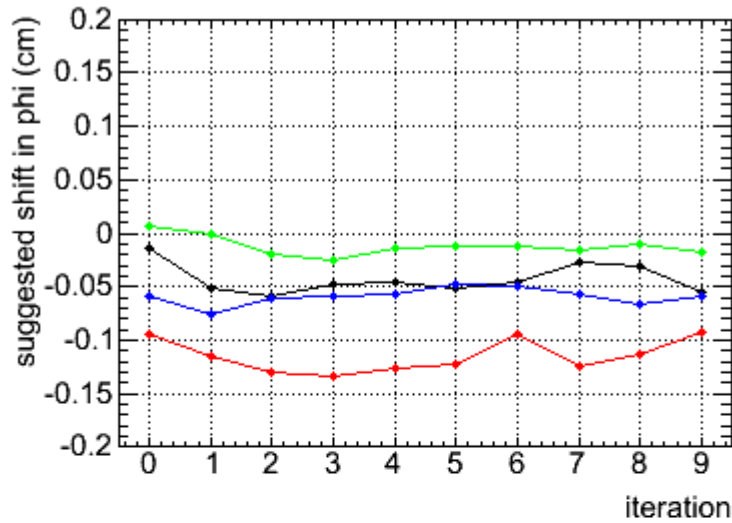


alignment procedure

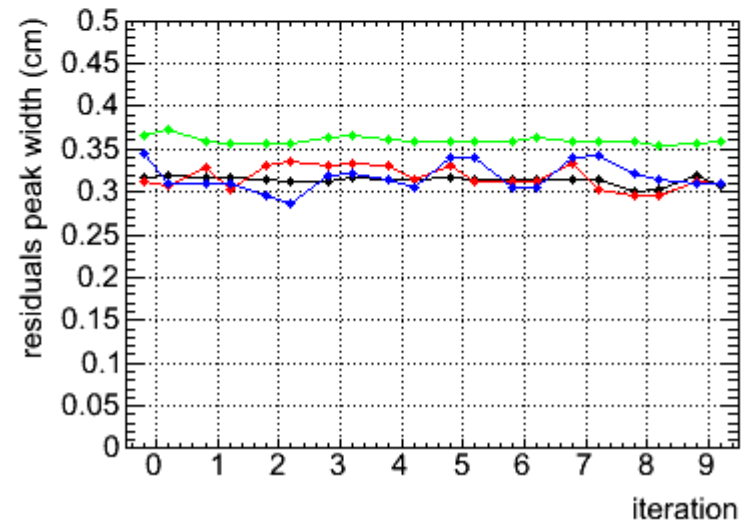
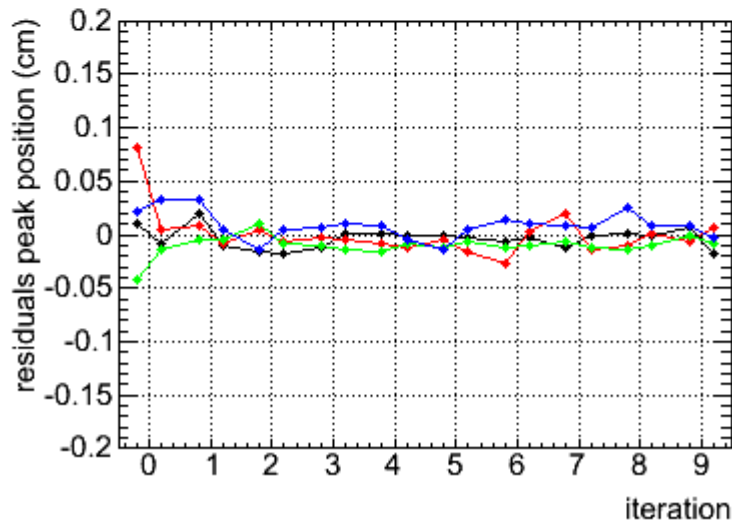
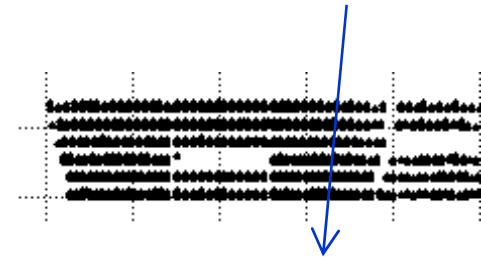


- 🌐 **keep L0 and L5 fixed**
- 🌐 **adjust inner ones to all (at least 4) others**
- 🌐 **(iteratively)**
- 🌐 **fit straight tracks**
- 🌐 **use "fast" minimizer**
(all 6 shifts and tilts allowed)

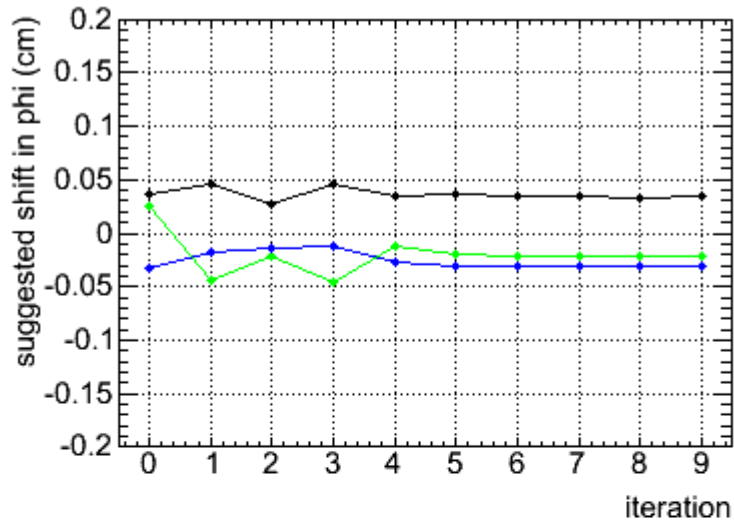
Münster cosmics, SM4



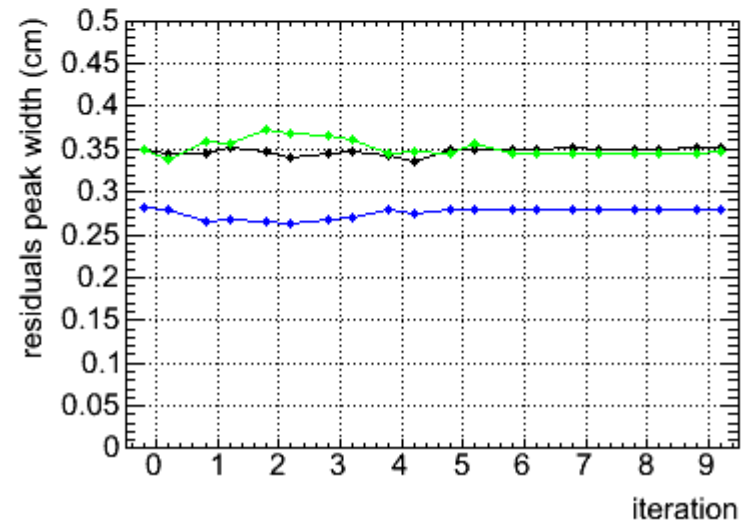
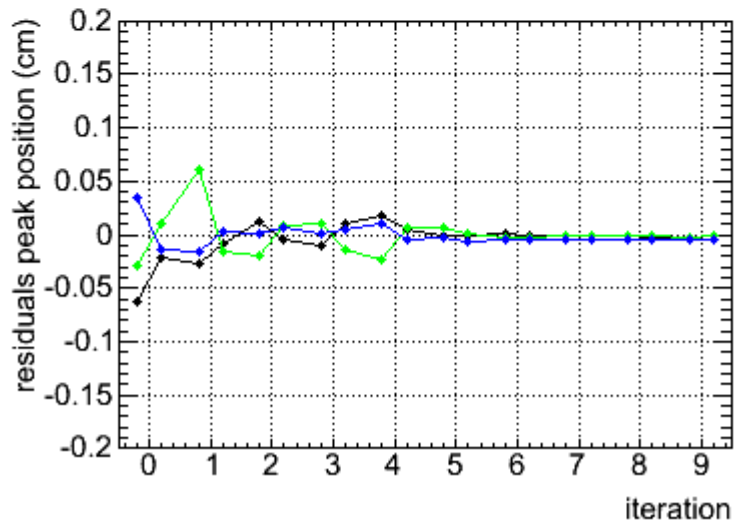
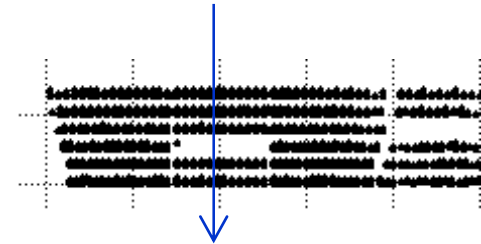
SM4, stack 1



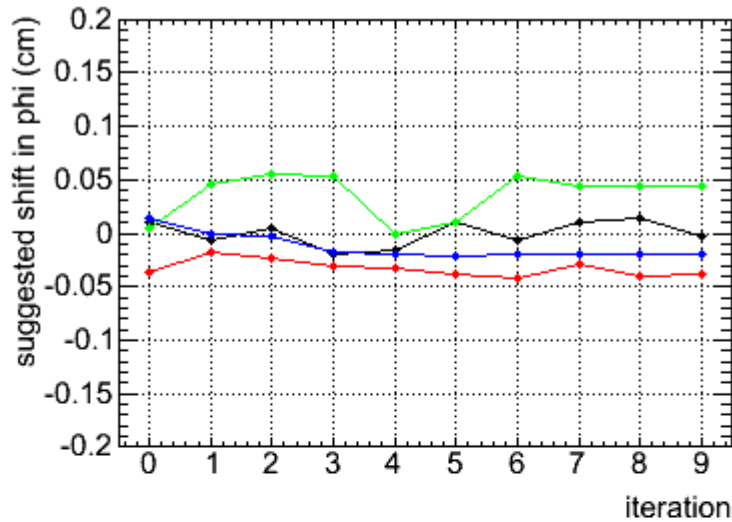
Münster cosmics, SM4



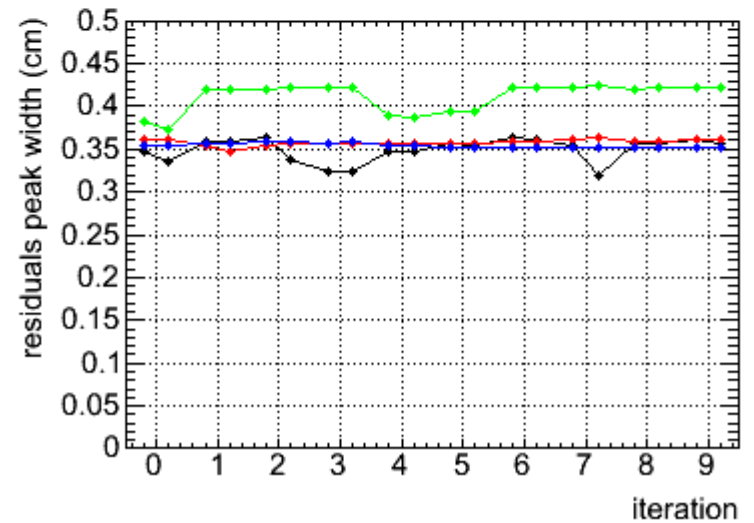
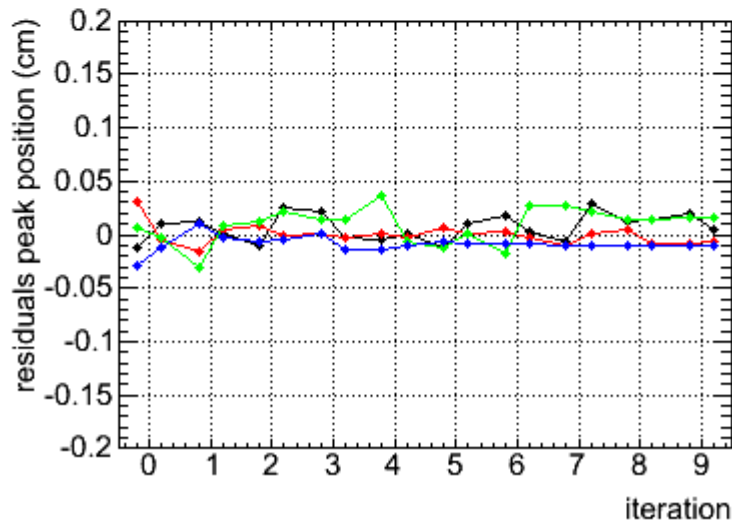
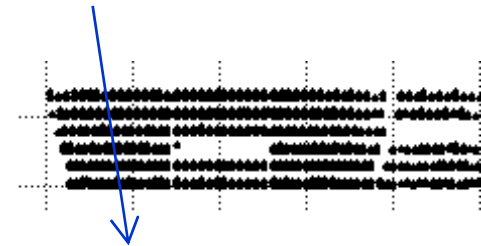
SM4, stack 2



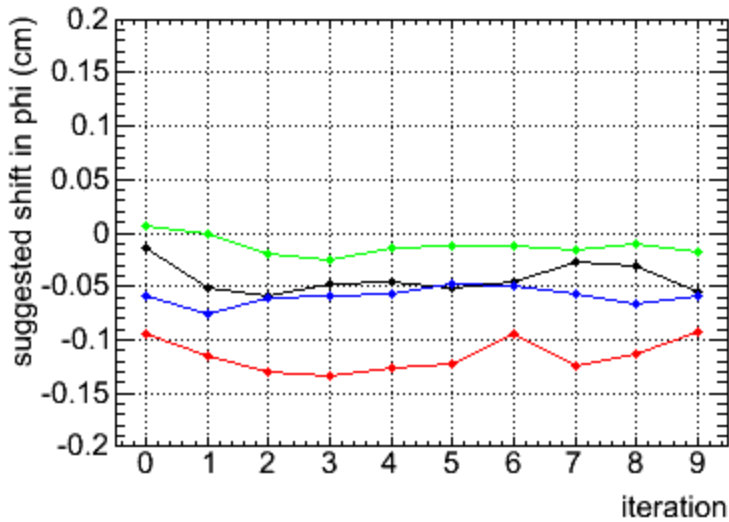
Münster cosmics, SM4



SM4, stack 3

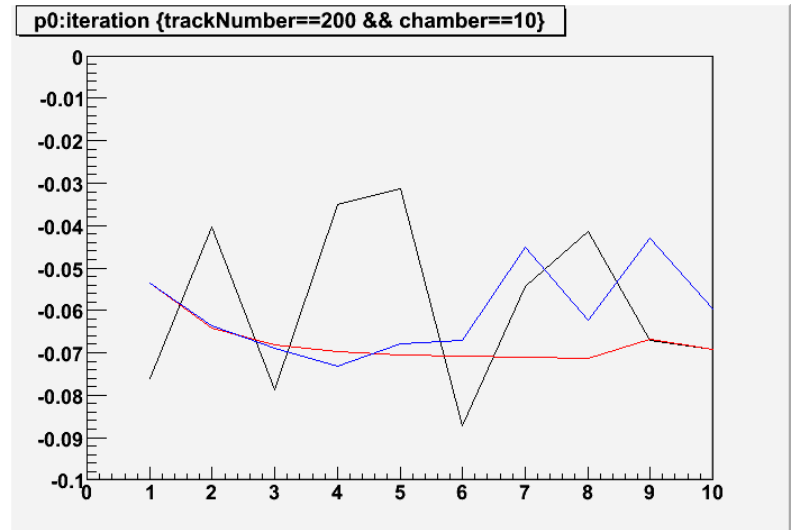


How many tracks per stack are needed?



← *this was with 1000 tracks*

Eva tested 200, 1000, 2000
2000 much better (flatter) than 1000

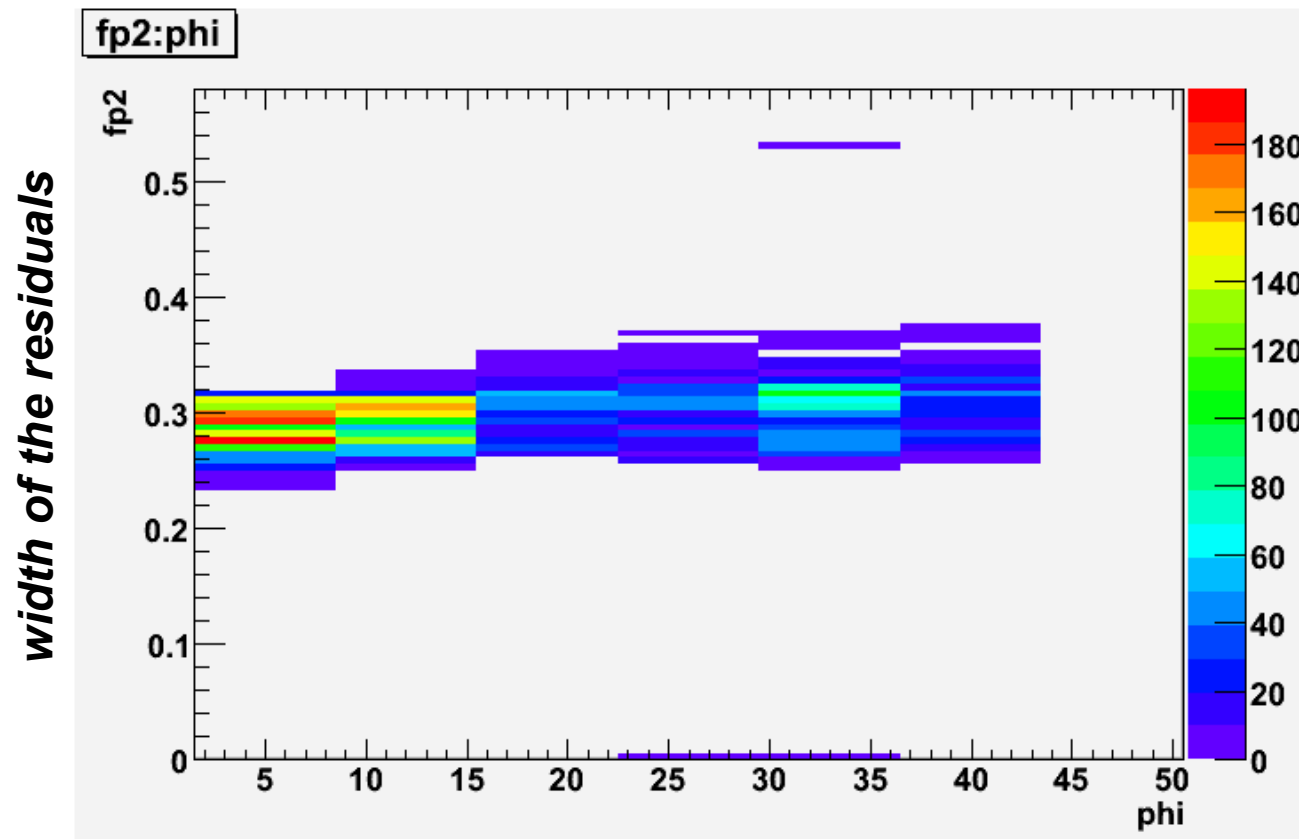


Münster cosmics, resolution

| <i>dataset</i> | <i>what</i> | <i>aligned to what</i> | <i>residuals peak width</i> |
|--------------------------|-------------|------------------------|---------------------------------|
| Münster cosmics | L3 | L0,L1,L2,L4,L5 | 0.30 cm |
| sim v4-11-Release | L3 | L0,L1,L2,L4,L5 | 0.18 cm |
| sim v4-11-Release | L0 | TPC | 0.22 cm |
| sim v4-11-Release | L5 | TPC | 0.80 cm |
| sim v4-06-Release | L3 | L0,L1,L2,L4,L5 | 0.07 cm |
| sim v4-06-Release | L9 | TPC | 0.11 cm |

Why resolution worse than in sim?

**Might be because of the tail Xe tail cancellation applied to Ar.
In this case, however, phi-dependence expected. Not seen (Eva):**



**btw., different groups of tracks give
within 0.1 mm the same alignment**

Münster cosmics, why poor resolution?

Might be because of the track cuts, wide open for cosmics and $B=0$

Under investigation by Eva.

Münster cosmics, summary

- 📍 *chamber alignment very good (typically within 0.5 mm)*
- 📍 *1000-2000 tracks per stack reasonable for alignment*
- 📍 *residuals **1.7** times wider than in simulation*
- 📍 *residuals with tracklets **2.2** times wider than with cluster*

Survey of the 4 supermodules at CERN?

The only opportunity seems: end of June

ALICE commissioning schedule

(Arturo Tauro, Sebastien Evrard on May 30)

| | | |
|-----------|---------|---|
| Wk 22 | | Continue global partition system check |
| Wk 23 | | Start production run Collect alignment data |
| Wk 24 | B FIELD | Collect cosmics L3 field -0.5T, Dipole -0.7T |
| Wk 25 | B FIELD | Collect cosmics L3 field +0.5T, Dipole OFF |
| Wks 26-29 | | Collect cosmics with SPD trigger for ITS internal alignment |
| Wk 30 | | LHC injection |

| | | |
|-------|---------|--|
| Wk 22 | TRD | <p>Install TRD 17 / cabling TRD 17 -> Done</p> <p>Compensator magnet interference test -> Delayed wk 24 (tbc)</p> <p>Close O-side door (Fri 30.5)</p> <p>Remove ventilation duct I-side (DBS)</p> <p>Insert flammable gases into detectors</p> <p>ITS cooling system commissioning</p> |
| Wk 23 | | <p>General cleaning inside L3 (Mon-Tue 2-3.6)</p> <p>Close I-side door / bolt doors (Wed 4.6)</p> <p>Install injection duct I-side</p> <p>L3 magnet / power supply tests (Thu and Fri 5-6.6)</p> <p>Tests of the ALICE compensator system (Fri 6.6 PM)</p> <p>DSO test (Fri 6.6 from 12:00 to 24:00)</p> |
| Wk 24 | B FIELD | <p>Cosmic run with field</p> <p>TI2 low intensity tests (14.6 and 15.6)</p> <p>Compensator magnet interference test</p> |
| Wk 25 | B FIELD | <p>Cosmic run with field</p> |

- Wk 26** **V0/FMD1** **Open I-side door 45 deg (23.6)**
Install ITS duct under mini frame and across L3 doors
Install mobile shielding O-side + stabilizers (restricted access to MNF)
V0-A installation
FMD1 in final position
Install muon GMS-LMS optical system
- Wk 27** **Close I-side door (Mon 30.6. Both doors closed and bolted)**
Install injection duct below mini frame (part 1/2)
Install mobile shielding I-side + roof + stabilizers
Removal of all remaining scaffoldings
Removal of all magnetic stuff from UX25
- Wk 28** **Install injection duct below mini frame (part 2/2)**
Install extraction duct above the shielding
Install plug in PX24 (beams + blocks)
- Wk 29** **Closure of LHC**
Final ventilation tests
- Wk 30** **First injection**

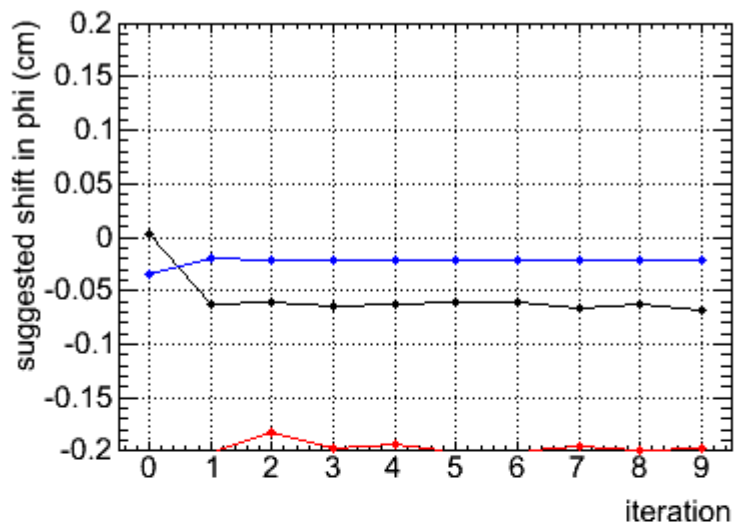
...
30/05/2008
Wk 37

First collisions at 10TeV

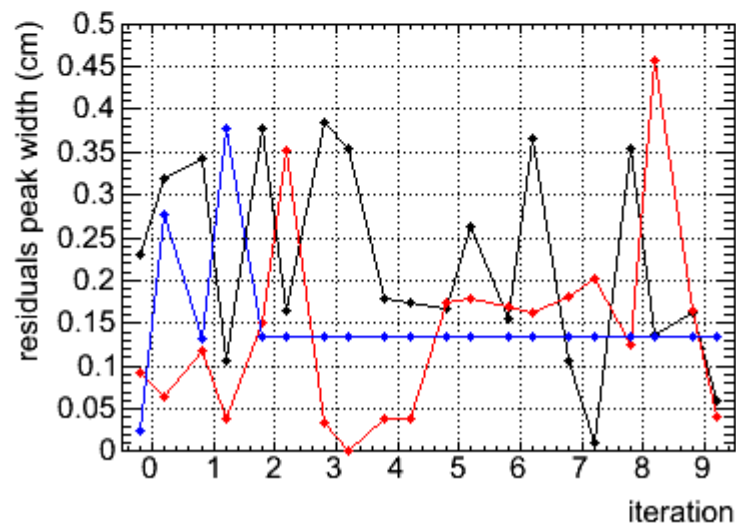
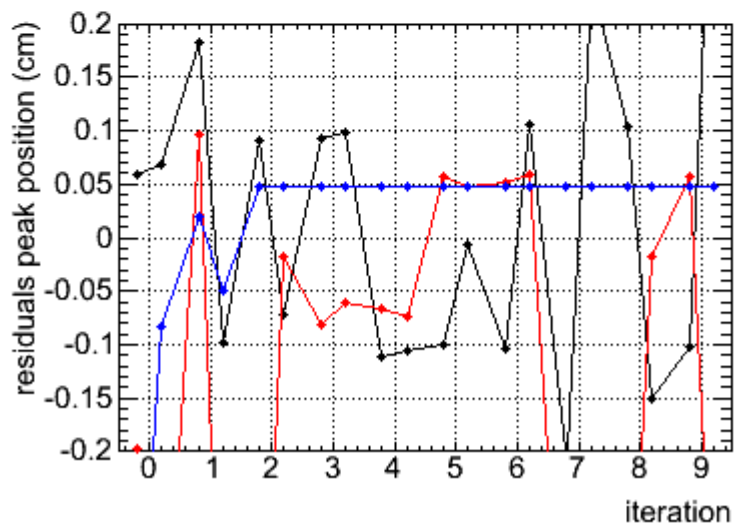
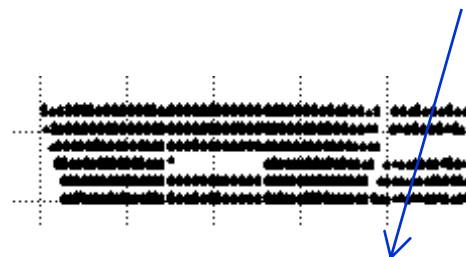
Arturo.Tauro@cern.ch
Sebastien.Evrard@cern.

backup

Münster cosmics, SM4



SM4, stack 0



Münster cosmics, SM4

