TOF offline code status report and cosmic run analysis

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for the ALICE TOF group

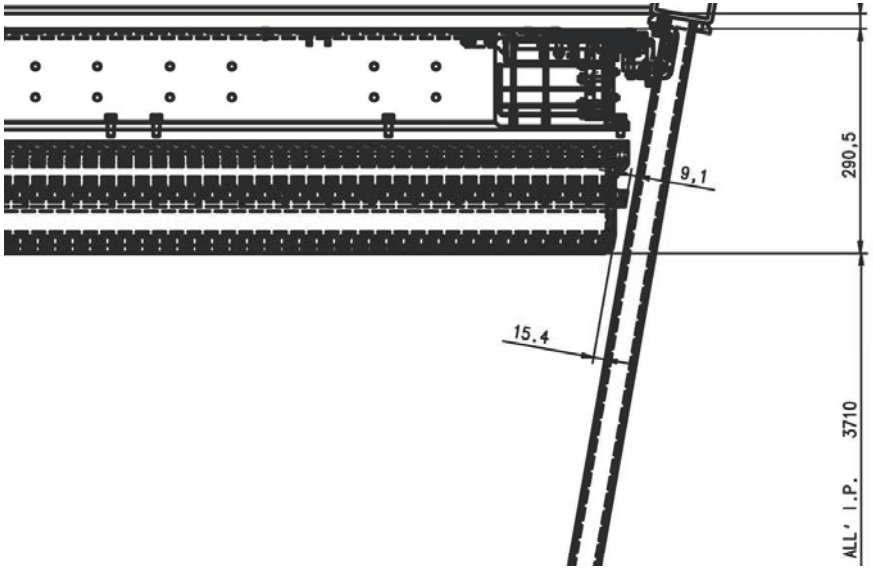
Outline

- TOF code review
- TOF data visualization code
- Analysis of data taken during the 12/07 and 02/08 cosmic ray runs

Last changes in the TOF code (1)

- Fixed a typing error in the AliTOFv6T0 class:
  - now correct material budget where the holes are
- In AliTOFv* classes removed the dependency from AliFRAMEv2 class to check the w/o hole TOF configuration
  - added a boolean variable and the corresponding getter and setter methods in the AliTOF class. By default the TOF configuration has holes in 3 sectors (13, 14 and 15) -see next slide-
  - now in the event configuration files we can remove the w/o hole configuration control
- Clearance around alignable volumes: ok
  - when frame+supermodules+strips have been misaligned, only 2 strips (to be compared with 1593 TOF strips) extrude their container volume and only plastic and air mixtures overlap in between them. We can neglect them.

AliFRAMEv2: TOF position changed

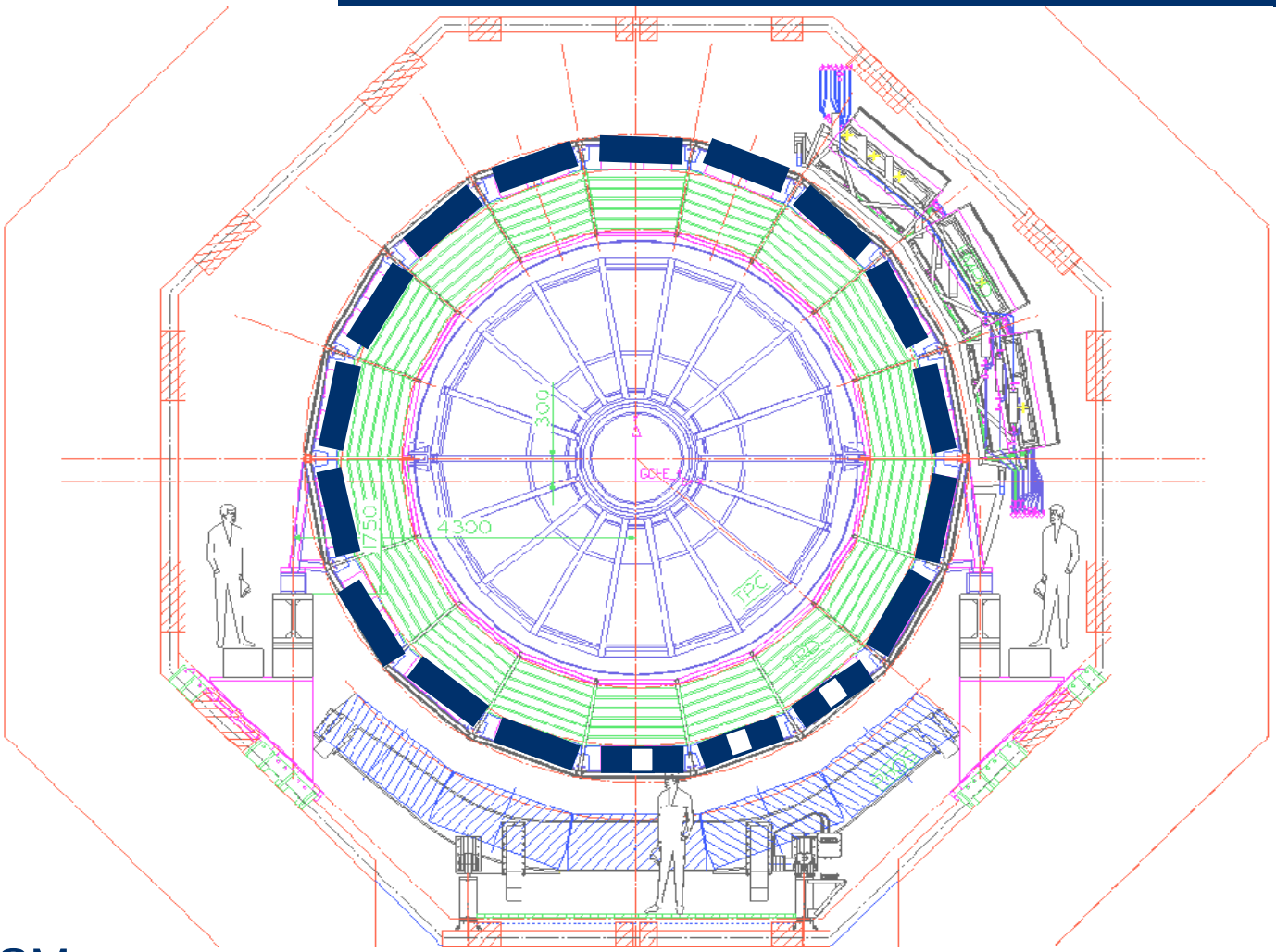


- Now, in the svn repository, we have:
  - R_{in}^{TOF} = 370,00 cm
  - ΔR^{TOF} = 29,00 cm
  - R_{out}^{TOF} = 399,00 cm
- According to this last plot, we have to change in the following way:
  - R_{in}^{TOF} = 371,00 cm
  - ΔR^{TOF} = 29,05 cm
  - R_{out}^{TOF} = **400**,05 cm

For A.Morsch

```
pb-d-128-141-130-184:~/AliRoot/LAST/new/STRUCT decaro$ svn diff AliFRAMEv2.cxx
Index: AliFRAMEv2.cxx
===================================================================
--- AliFRAMEv2.cxx      (revision 24950)
+++ AliFRAMEv2.cxx      (working copy)
@@ -901,7 +901,7 @@
-  ptrd1[3] = 14.5;
+  ptrd1[3] = 14.525;
@@ -909,7 +909,7 @@
-    gMC->Gspos(nameCh, 1, nameMo, 0., 0., 42.53, 0, "ONLY");
+    gMC->Gspos(nameCh, 1, nameMo, 0., 0., 43.525, 0, "ONLY");
```

TOF supermodules (SMs): default geometry



TOF SM

TOF SM without the central module (hole region)

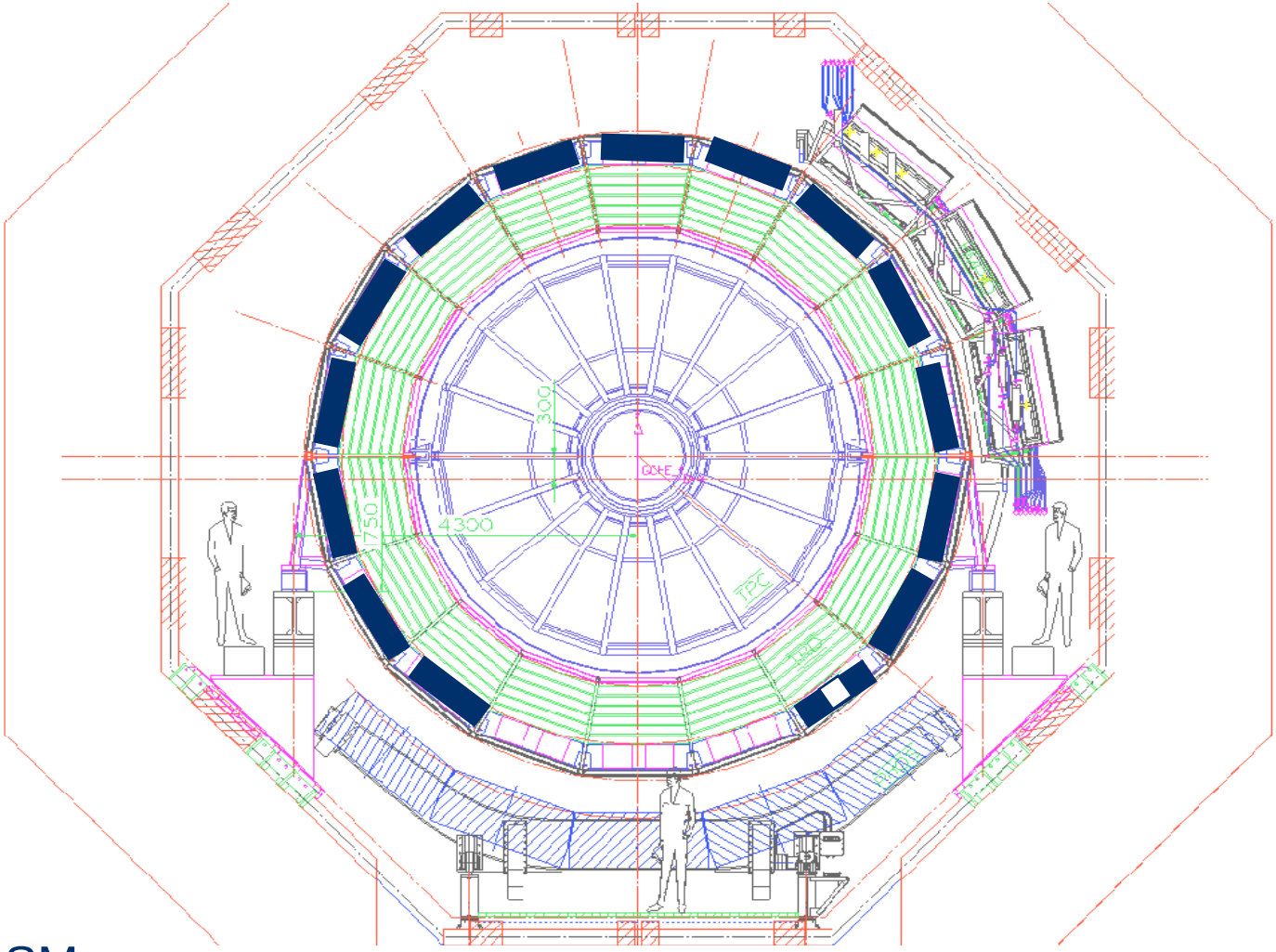
Last changes in the TOF code (2)

- Removed the differences in between the two raw data reader versions and fixed a small bug
- DCS FXS output file: implemented in the TOF preprocessor (C.Zampolli and R.Preghenella)
- DA and preprocessor: many changes
  - This Friday, C.Zampolli will talk in detail about
- New class introduced to map the different lengths of the 6372 signal cables that connect the front-end and the read-out electronics in between them (P.Pagano): to be commit in this week
- Suppressed some of coding convention violations:
  - now there are 11 RC11 and 32 GC2 violations

Last changes in the TOF visualization code

- In the EVE folder:
  - New methods and macros to visualize raw data, as TEveQuadSet, like digits, and clusters, as TEvePointSet: already committed in the SVN repository (done on 01/25/08)
  - Implemented a new class , called AliEveCosmicRayTracker, to select TEvePointSet objects (clusters, as example) and to fit them with a 3D straight line (in SVN repository till 04/13/08):
    - by taking into account the AliEveTrackFitter class and the algorithm prepared by L.Moneta to minimize (with TVirtualFitter class) the distance between the experimental points and the 3D straight line, this class is a TEvePointSet interface to allow visual straight line fit. It creates a set of points by listening to selected signal of any TEvePointSet object. After selection, the list is passed to TVirtualFitter class which returns four 3D straight line parameters. The fit result is visualized with a TEveLine object.

TOF supermodules (SMs) already installed

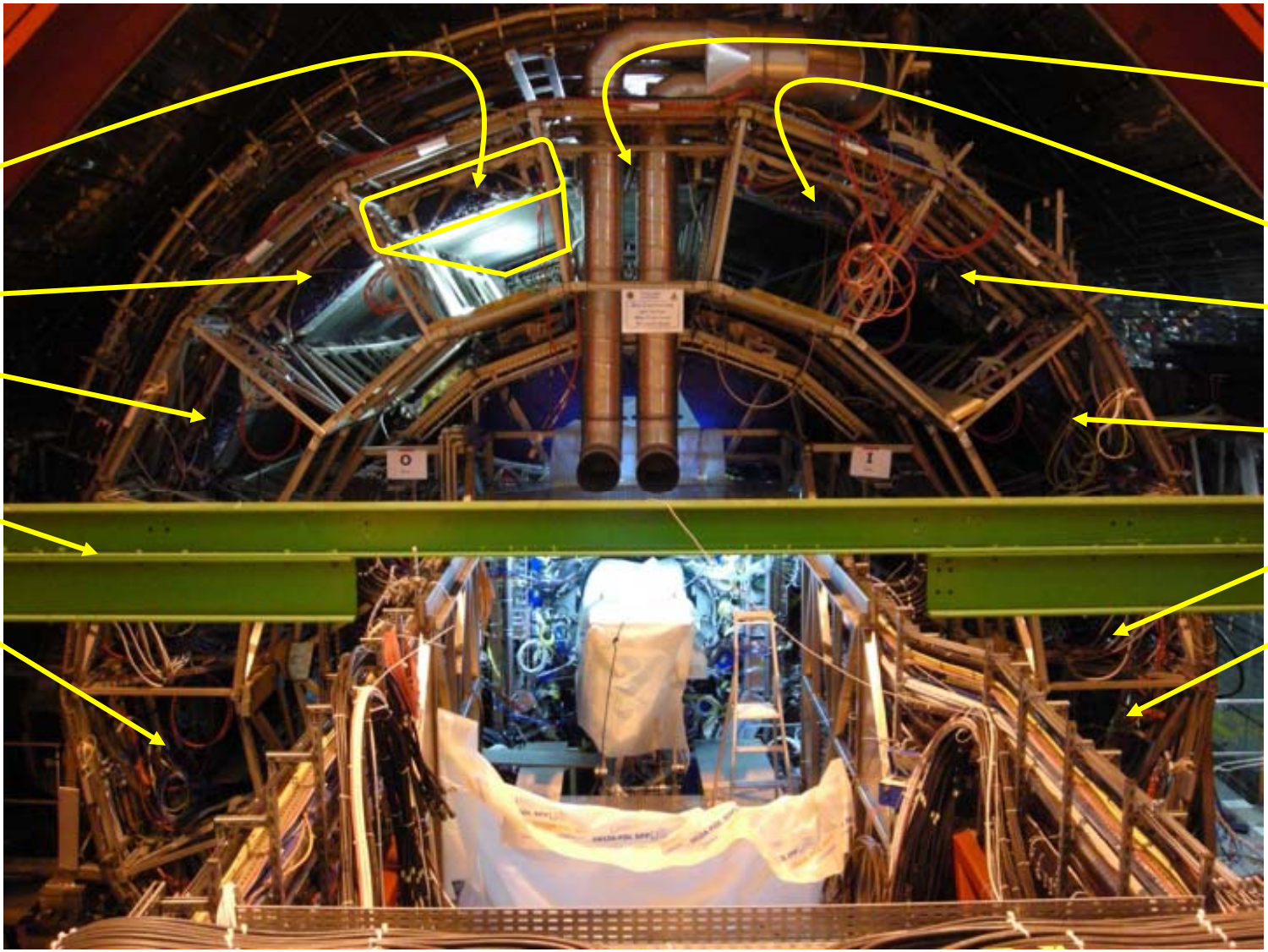


TOF SM

TOF SM without the central module (hole region)

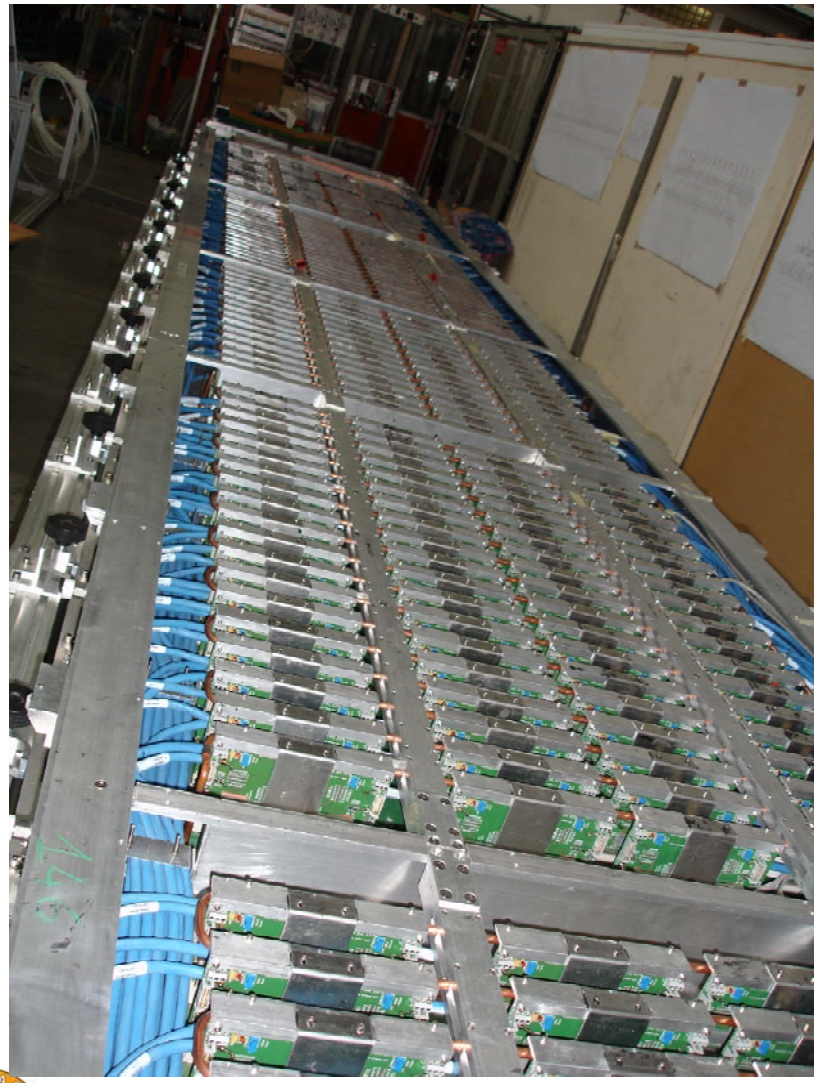
TOF SMs already installed (03.04.08)

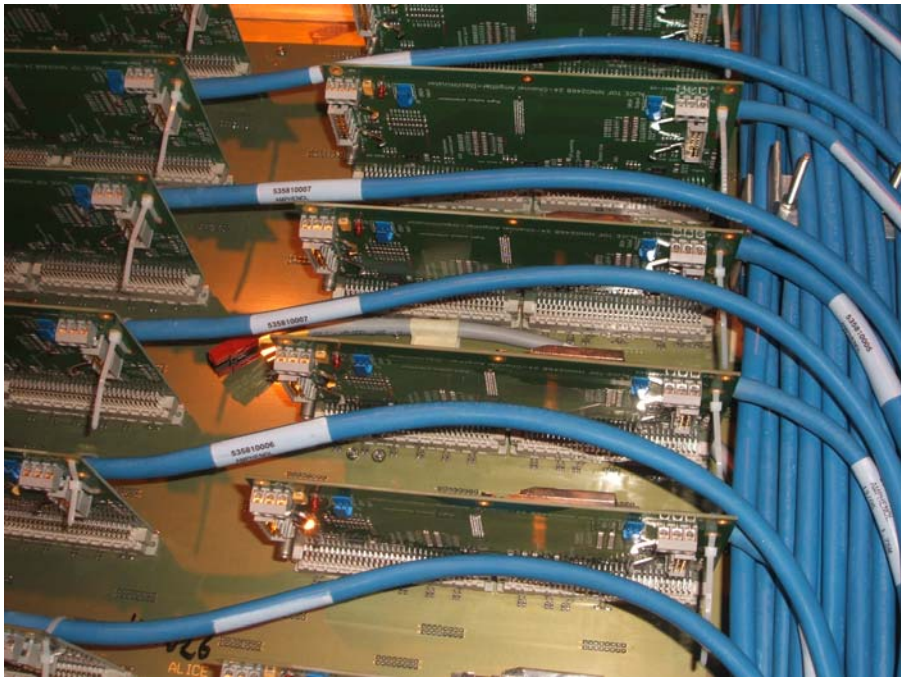
Some of the installed TOF SMs



Some of the installed TOF SMs

TOF signal cables and time delays





Number of TOF signal cables:

- 96 pads per strip,
- 91 strips per SM (76 strips per SM with hole),

⇨ 152928 TOF pads;

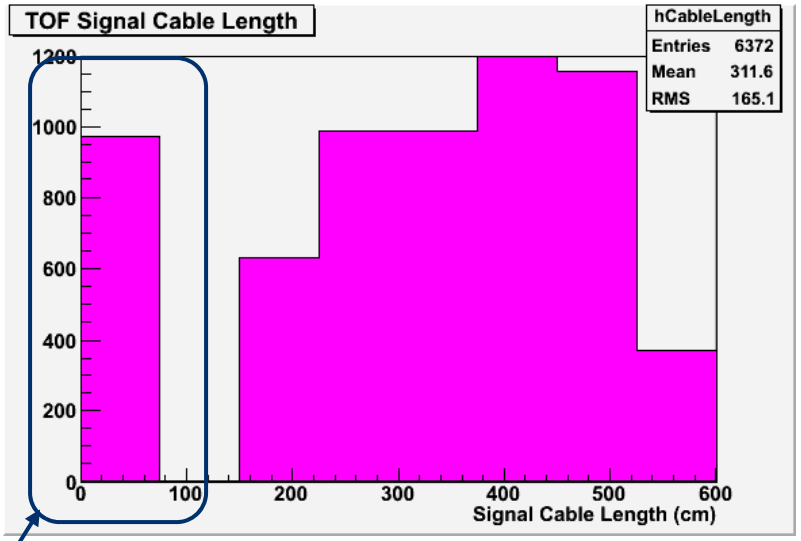
- 24 pads per FEA (and, then, per cable),

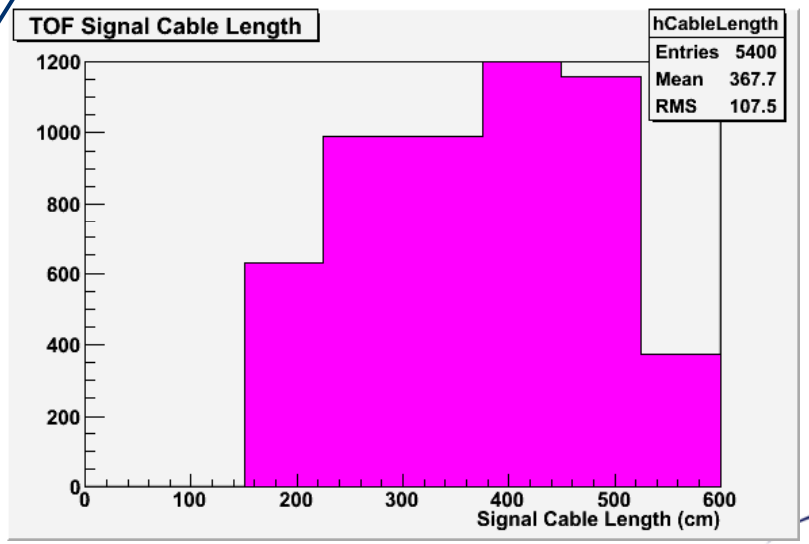
⇨ 152928/24 = **6372 signal cabl**

Map of the TOF signal cable lengths

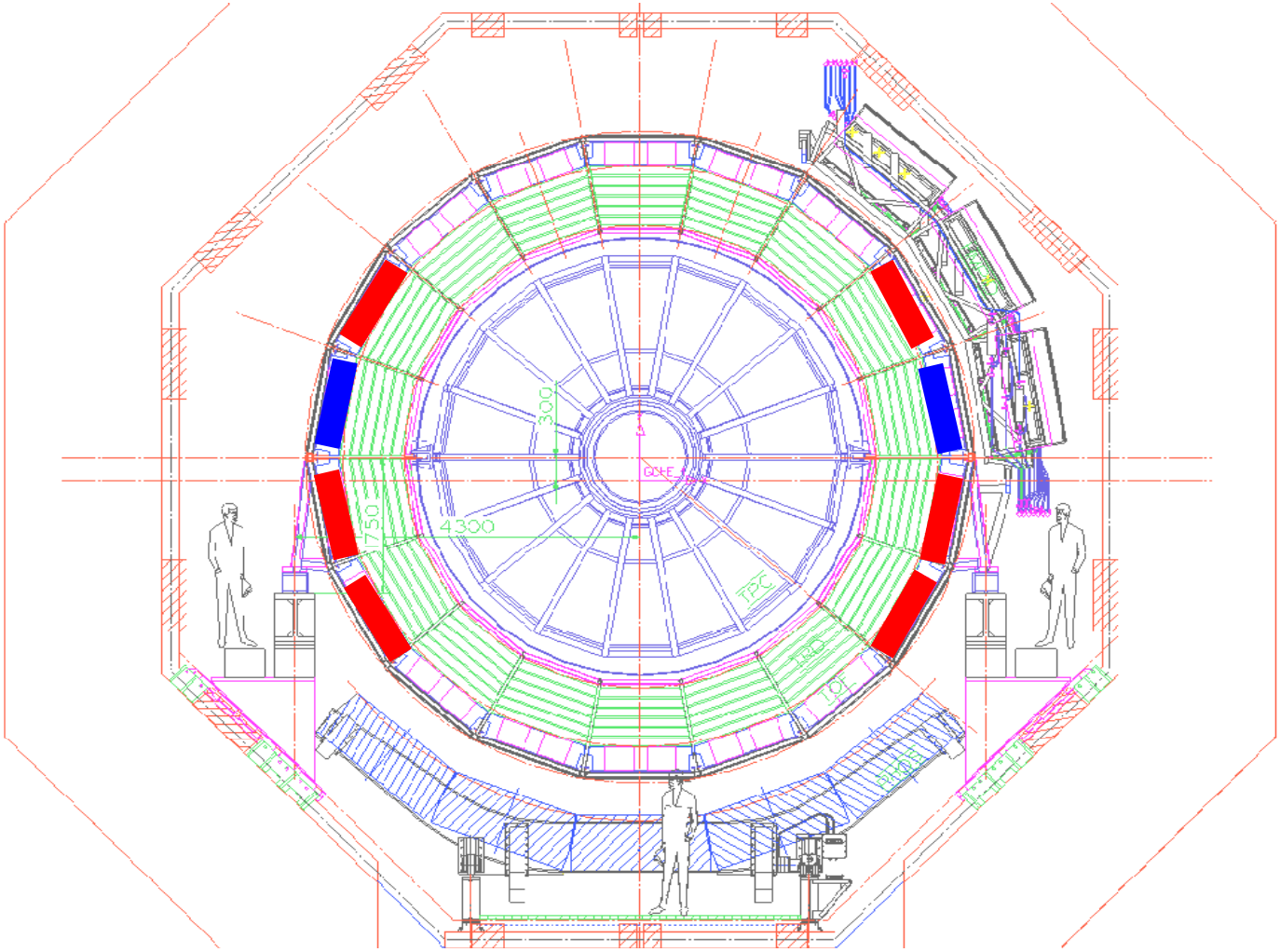
- AliTOFCableLengthMap class:
  - to take into account the different time delays due to the different signal cable lengths
  - to equalize the time-of-flight measurements (checked in the TOF visualization code, when the raw data are read)
  - useful during the last two cosmic ray runs

Due to the TOF SMs not installed (numbers 12, 13 and 14)





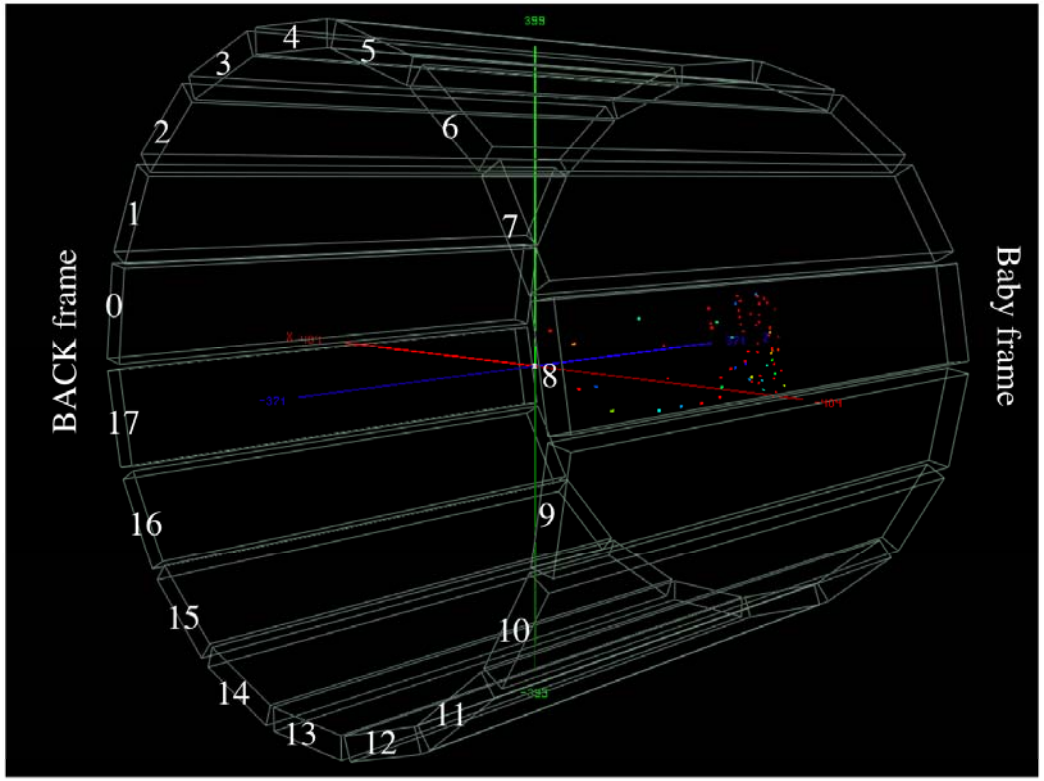
TOF SMs installed and read to take data during the 12/07 cosmic ray run



TOF SM installed and ready to take data (only C side)

TOF SM not ready to take data

12/07 cosmic ray run: first TOF raw data visualized

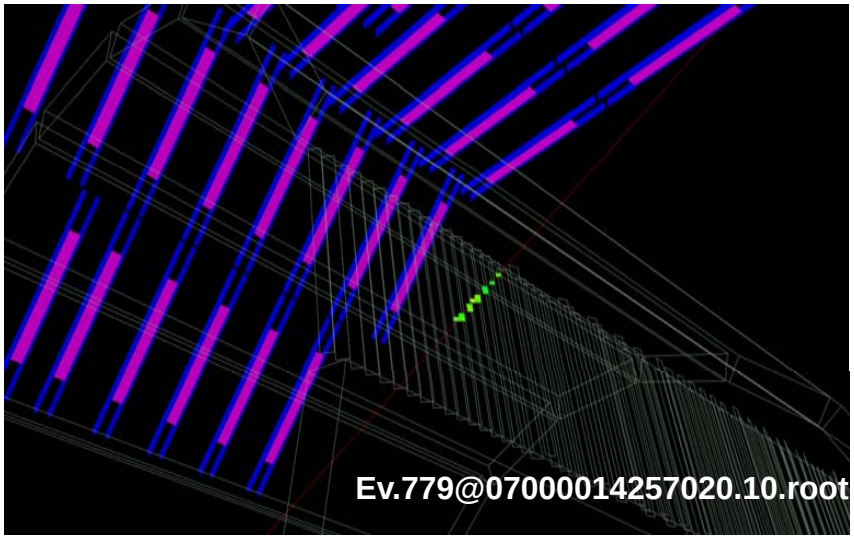


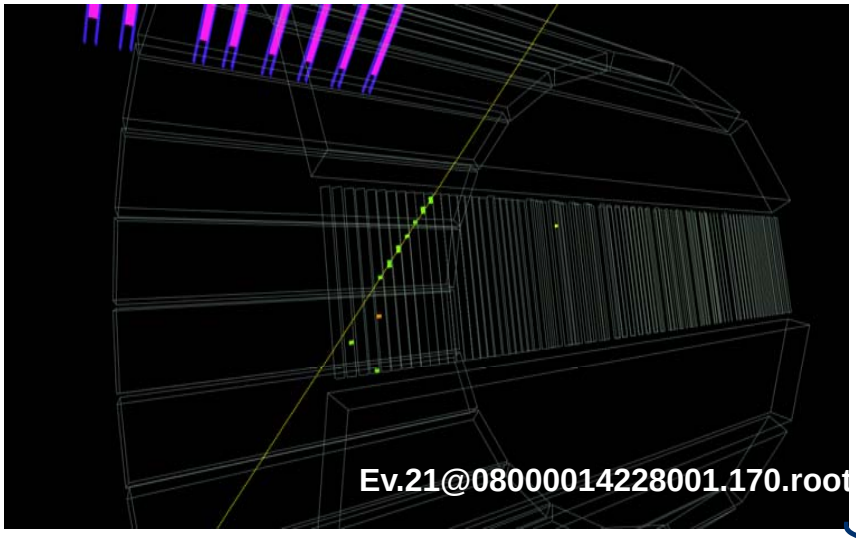
TOF raw data color according to tof value

TOF volume numbering and equipment IDs: perfect agreement

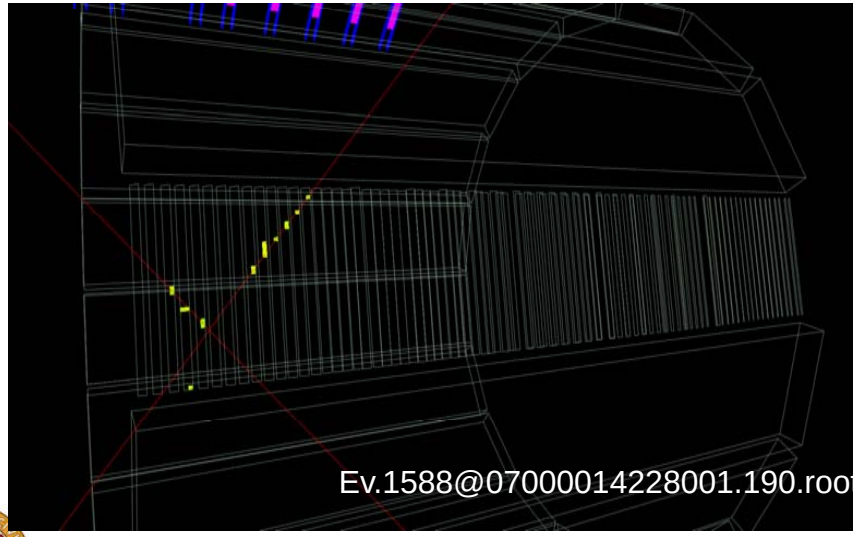
Some muon “tracks” on the TOF detector

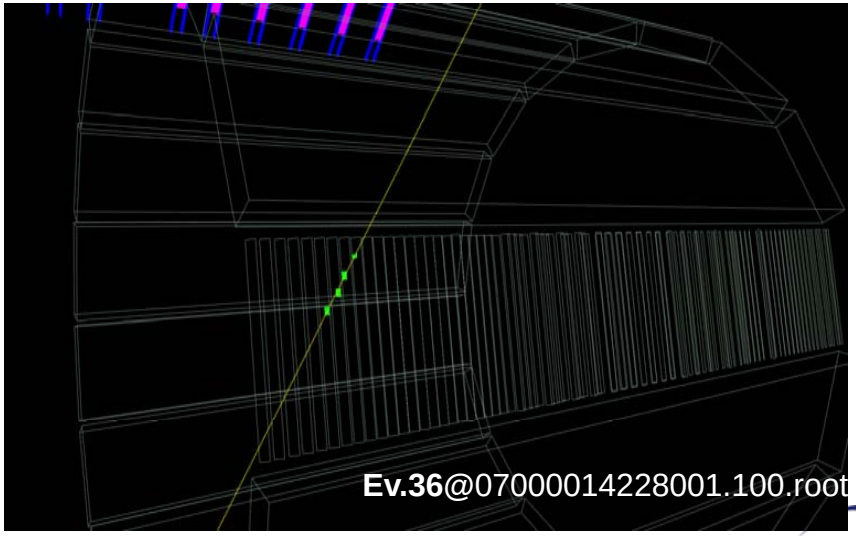
BACK frame



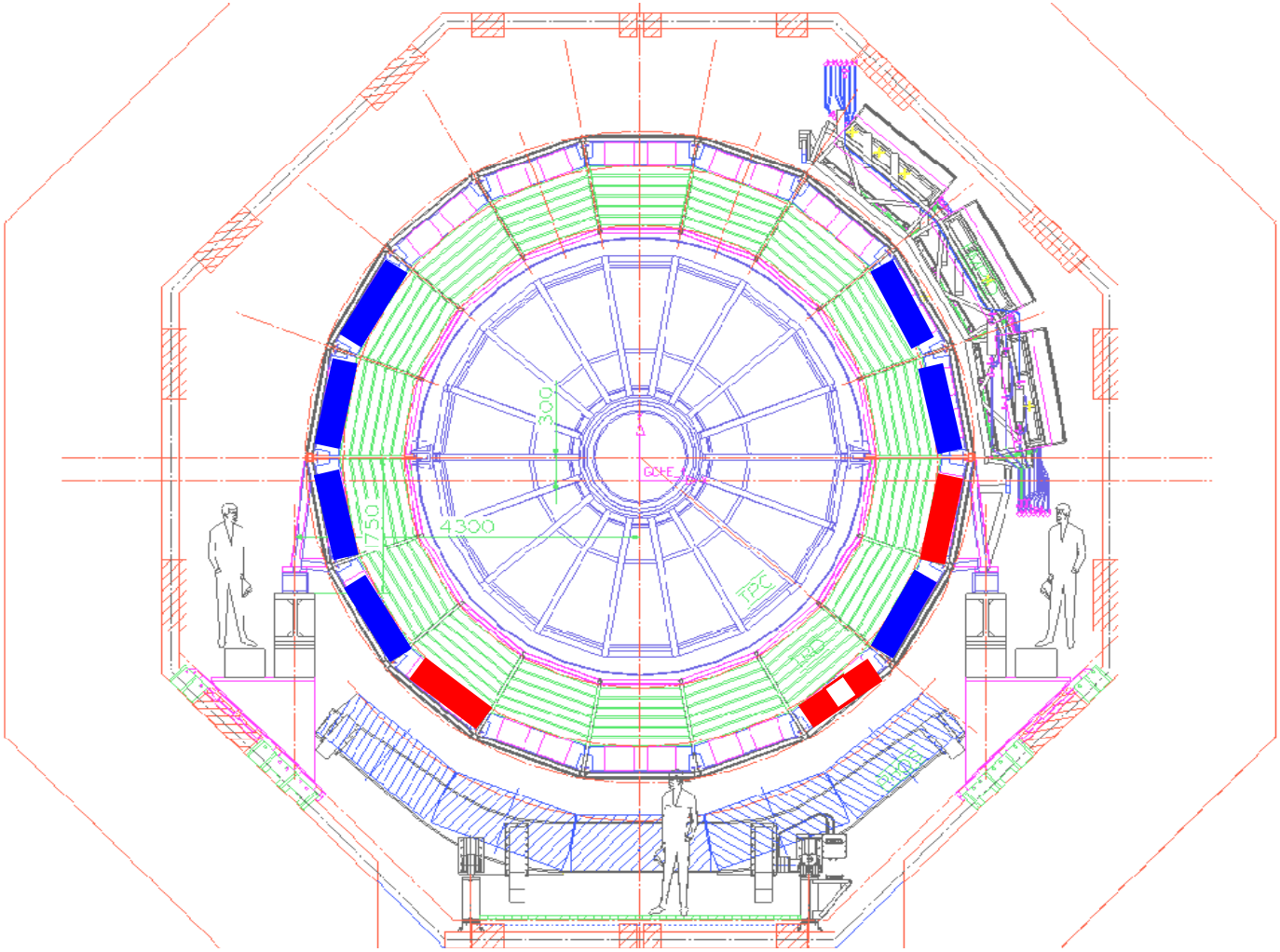


Baby frame





TOF SMs installed and ready to take data during the 02/08 cosmic ray run

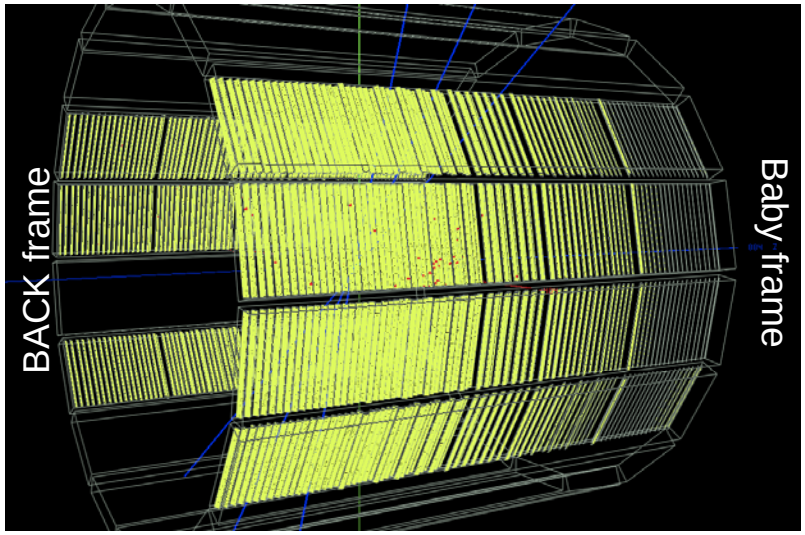


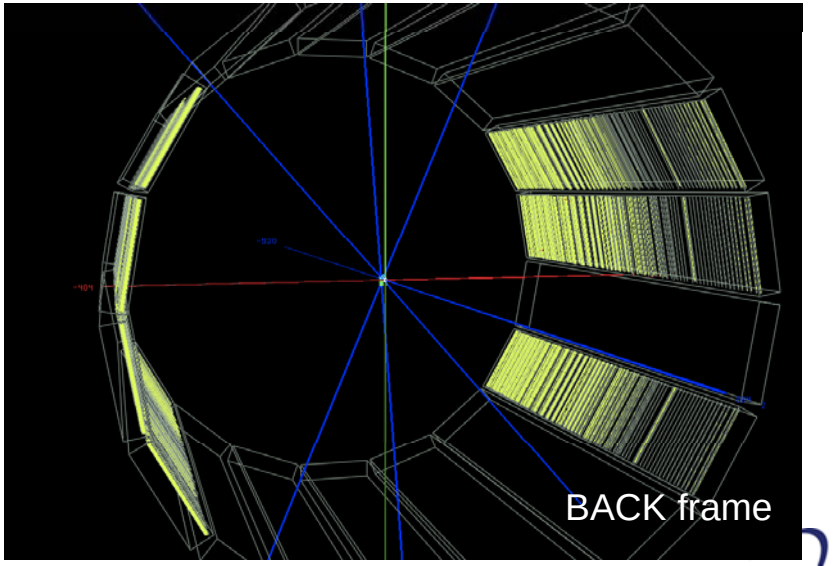
TOF SM installed and ready to take data (only C side)

TOF SM not ready to take data

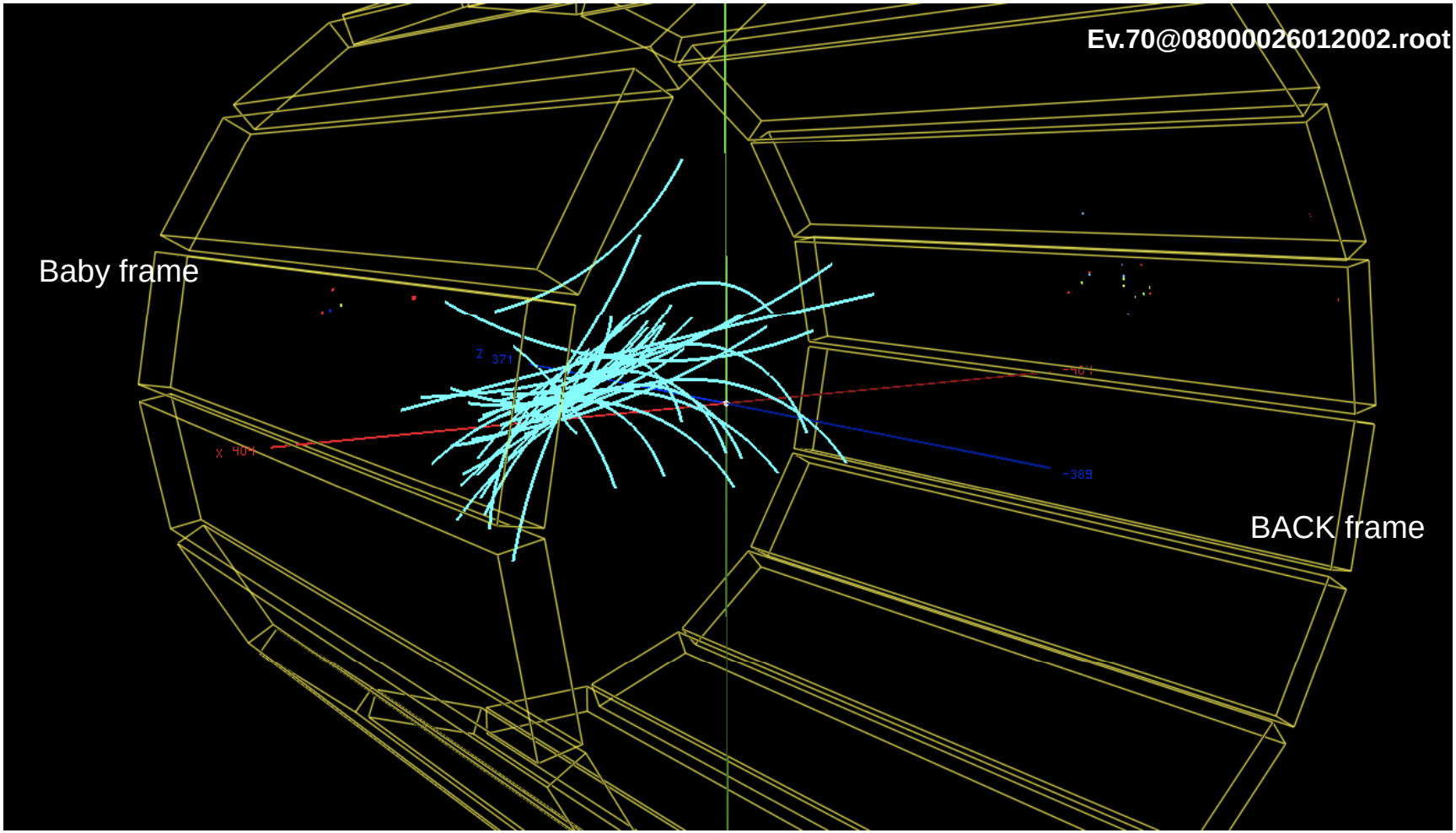
First three events seen by ITS

- First events reconstructed by the SPD layers:
  - 08000022252001.3630.root (ev. 100)
  - 08000022252012.3990.root (ev. 31)
  - 08000022252019.420.root (ev. 84)
- The fitted tracks seem to go out from the TOF active area.
- I have to check if some of the other ITS events (http://tydes.web.cern.ch/tydes/run_feb/physics_good) go in the TOF SMs



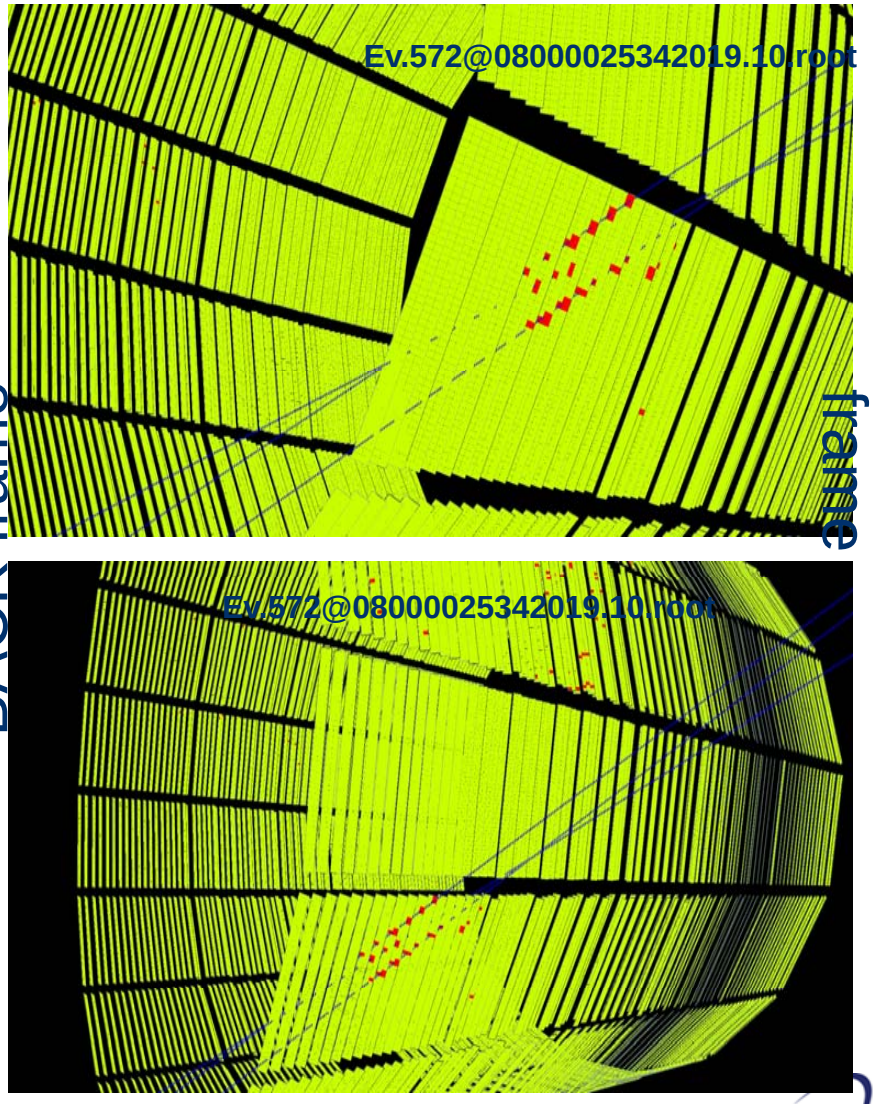


TRD reconstructed event



Thank to A.Bercuci, to give me more detail about

A funny event triggered (TOF diagonal trigger SM1&&SM10)



Conclusions

- We started the analysis on the data taken during the 02/08 cosmic ray runs in order to debug the TOF trigger. To do that, the tracking detectors should help us. But:
  - the TPC was not available;
  - the ITS acceptance matches the TOF diagonal trigger in a very small region (only the TOF C side was running)
  - for the TRD we have only reconstructed tracks, it is not possible visualize raw data or clusters
- TOF trigger:
  - it is on the right way (see E.Scapparone talk during last commissioning workshop)
  - at this stage, we need a tracking detector to debug it

Back up

Map of the TOF signal cable lengths (time delays)