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mCBM 2022
Ni-Ni run 2391

Tracking
STS – TRD2D

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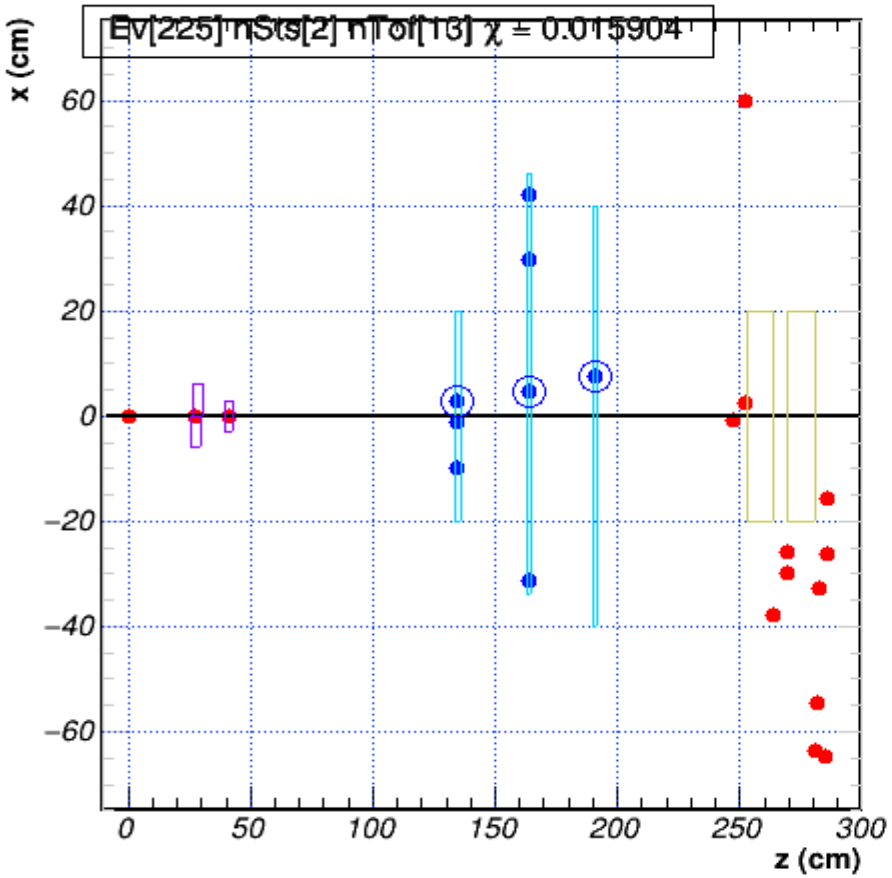
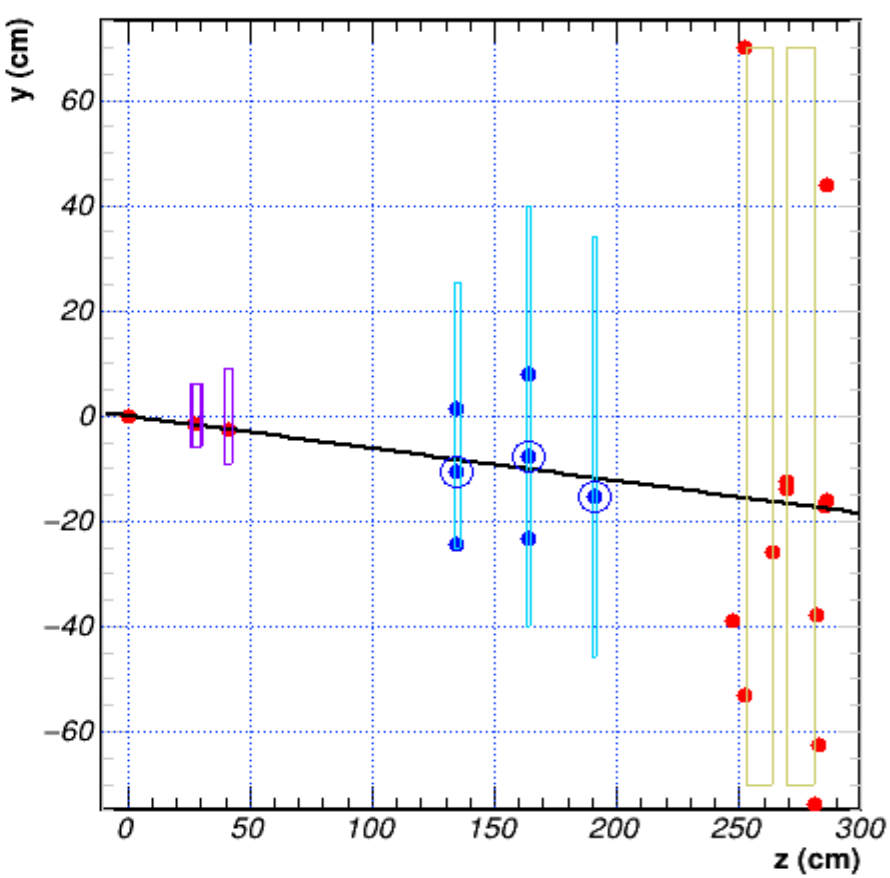
Technical Board
5th July 2022

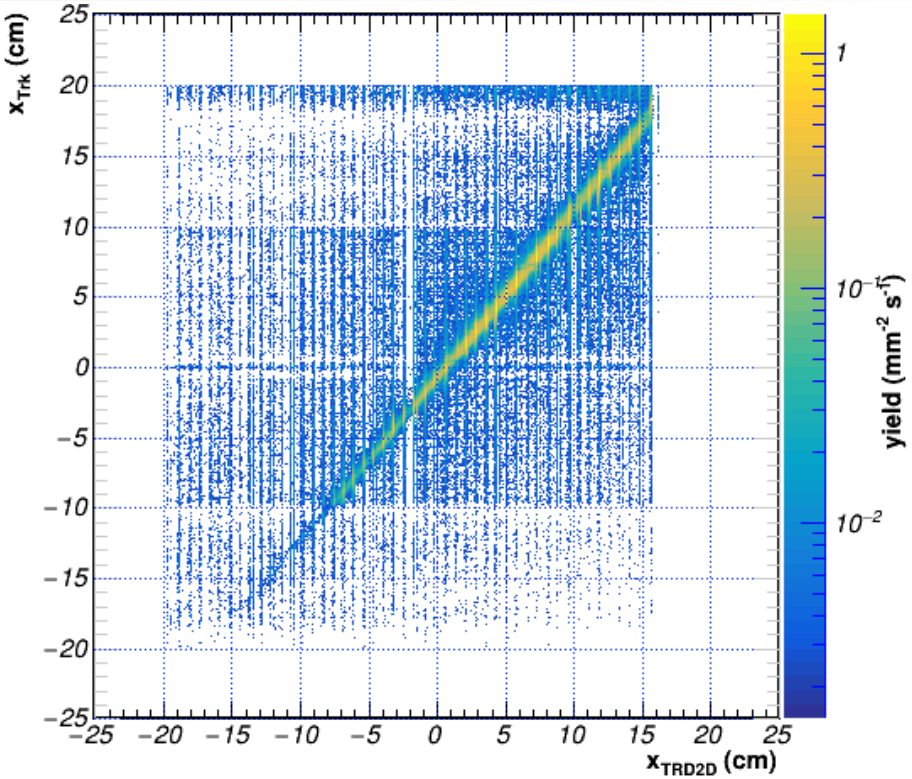
The track toy-model

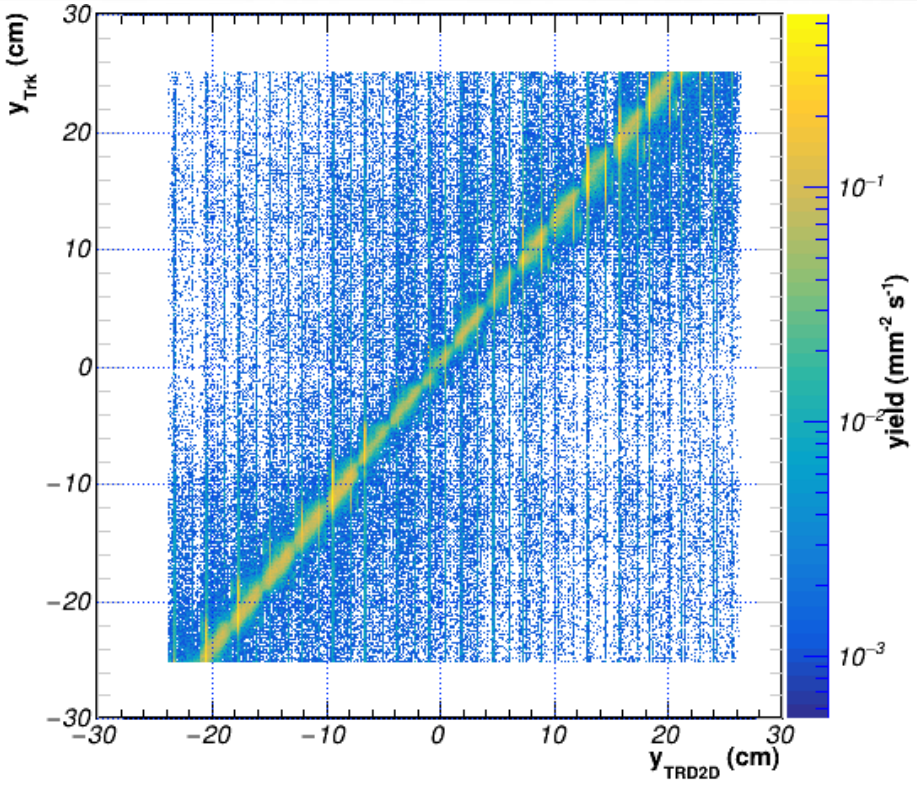




- **Event** selection based on *T0 only*
- **Track** selection based on *STS 2 hits in 2 different units*
- **Vertex** defined @ (0,0,0)
- **Hit TRD** matched hit based on min distance to Vx+STS fit projection

TRD2D – STS (track) correlation

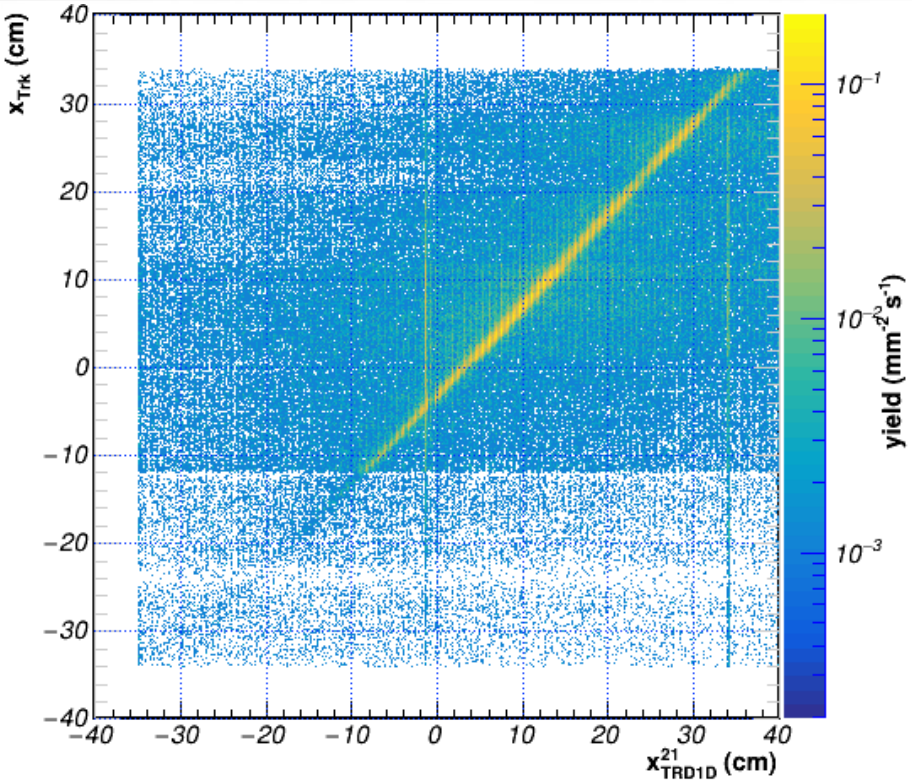


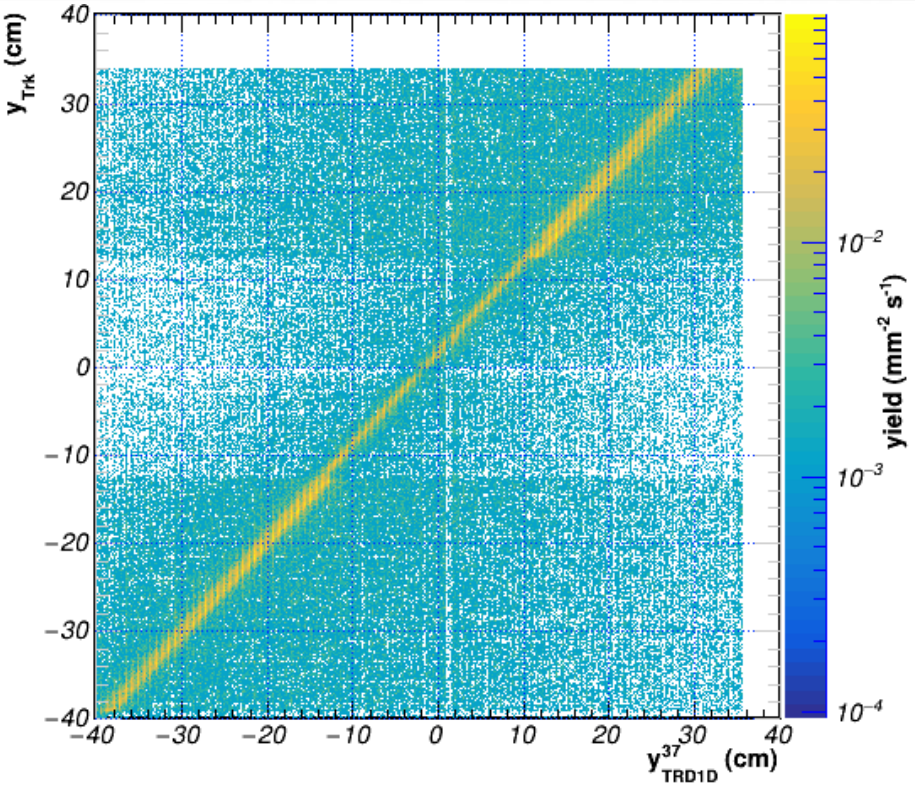


Instrumentation premiere (according to our knowledge)

- First time a 2D position sensitivity is demonstrated with a “standard” MWPC
- … by time correlation with references (STS, T0) of different technologies.

TRD1D – STS (track) correlation

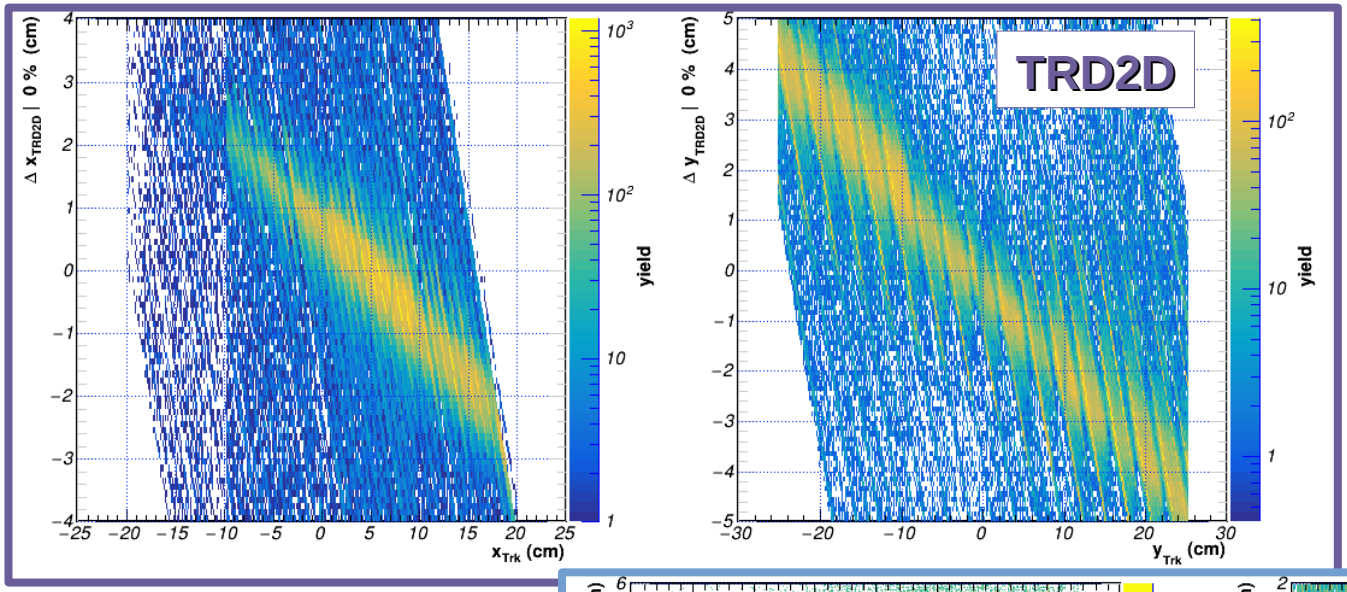




Reference

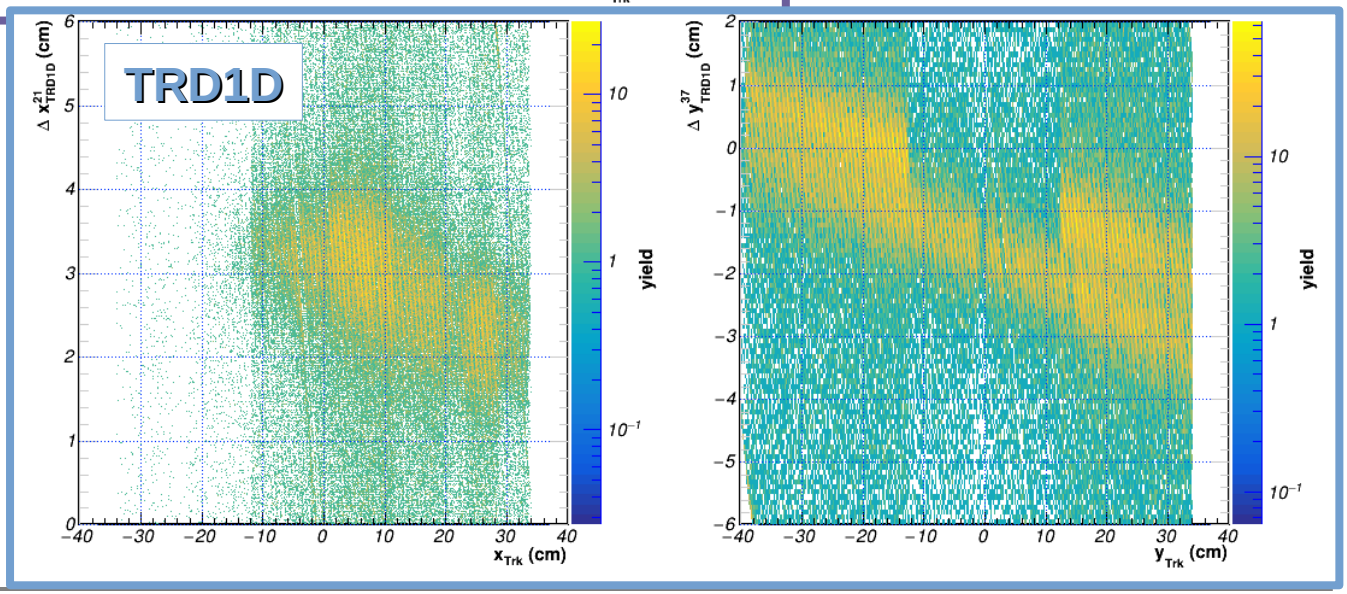
- Same selection of tracks is correlated with the 2 x TRD1D orthogonal detectors.
- … qualitatively similar position performance with 1 x TRD2D.
- … TRD1D data affected temporarily by noise from neighbor experiment

Alignment & Position resolution

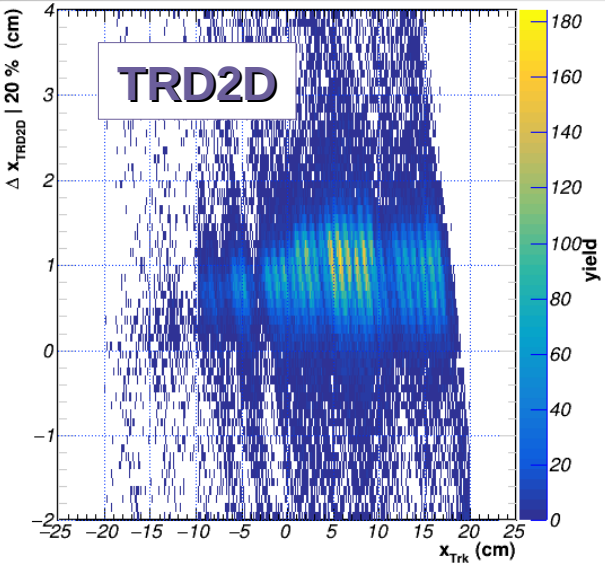


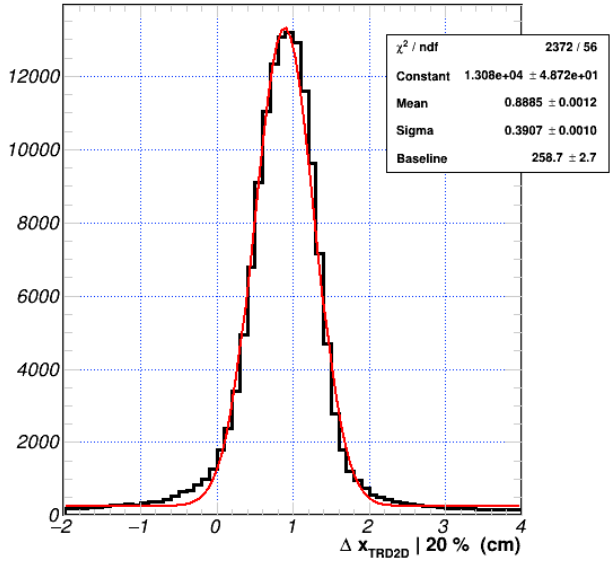
Systematic shifts of residuals in both directions for all 3xTRD show misalignments.

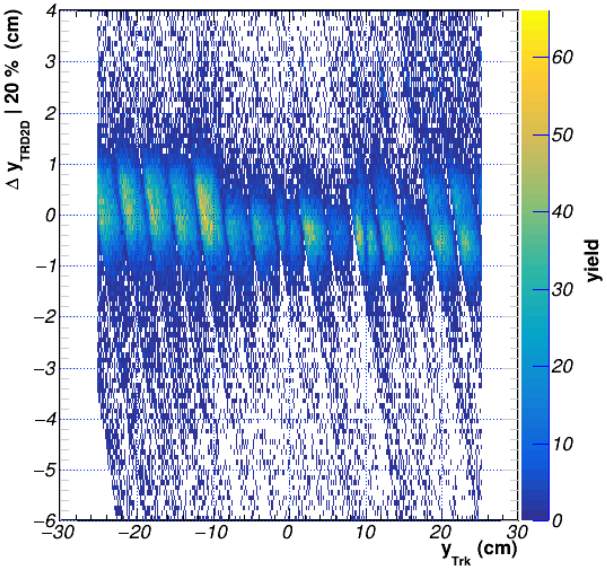
For TRD2D the tilted shift is induced by the e.g.
wrong assumption of v_x = (0,0,0)

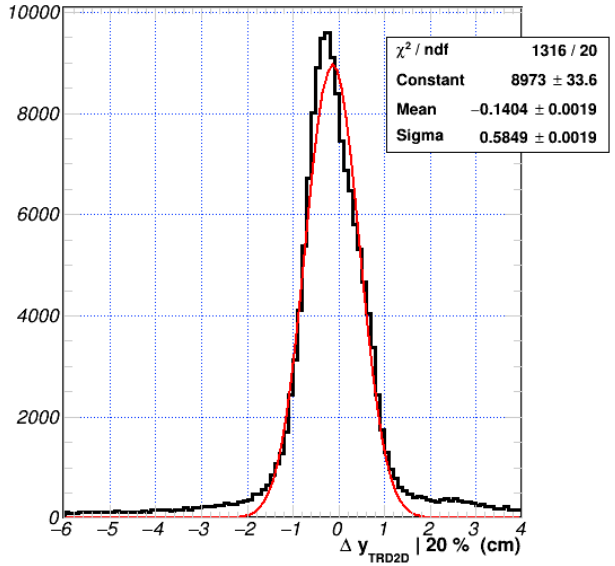


Alignment & Position resolution





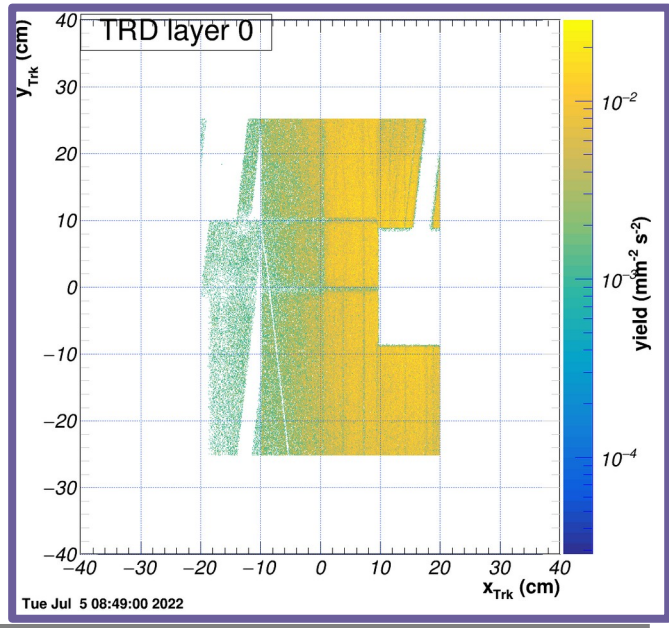




→ The **same** scale factor of 20 % was applied to **both x and y** residuals which **mimic the z alignment** of v_x or STS or both.

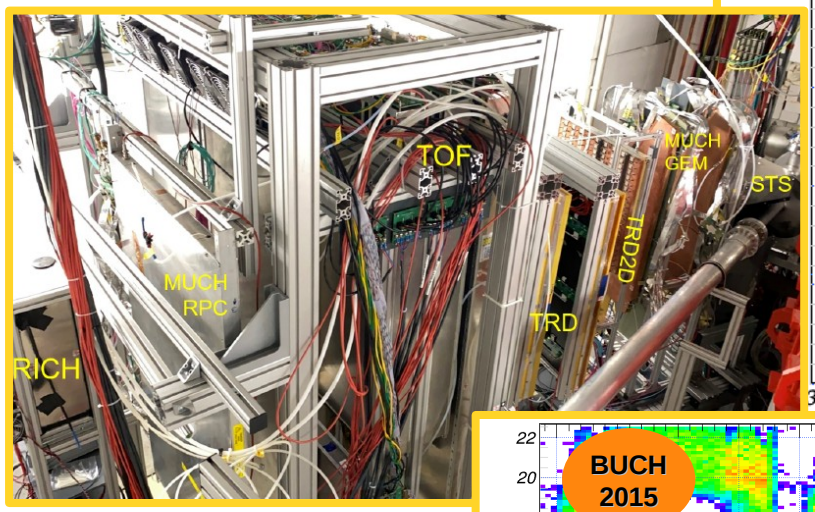
→ A crude estimate of **track+TRD2D resolution** is on mm levels for both x (4mm) and y (6mm) for cluster size above 2 digis.

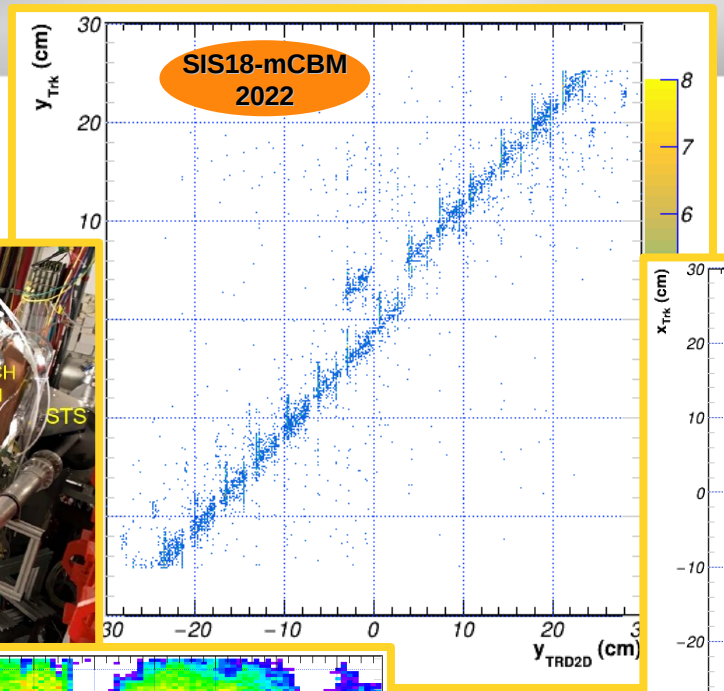
→ Track extrapolations should have large contributions to resolution.

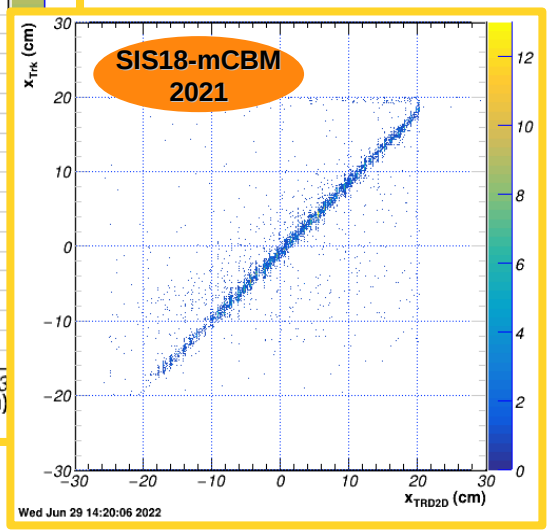


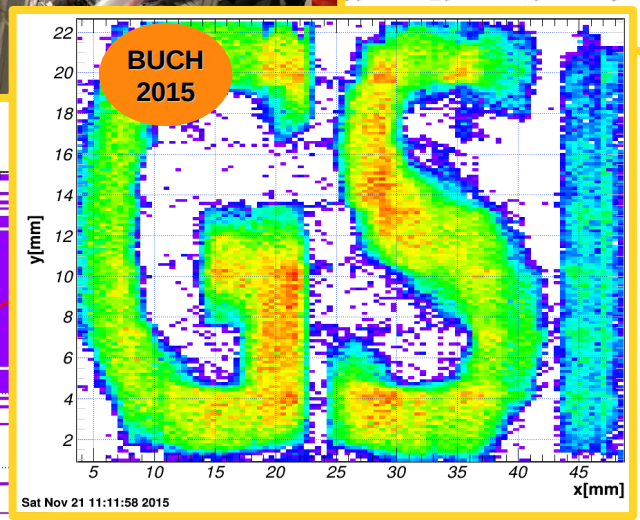
Promoting CBM @ GSI web

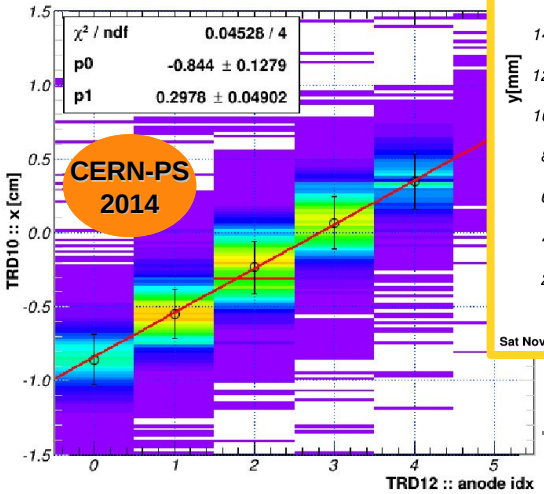
TRD-2D @ (m)CBM
Global tracking readiness











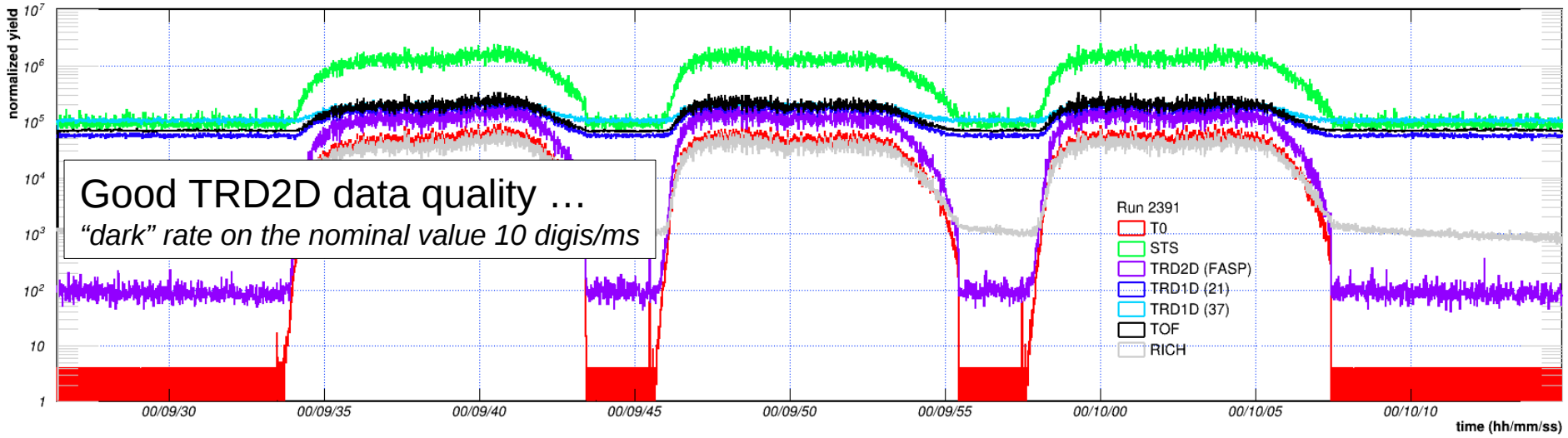
We propose 2 GSI “news” web contributions asap.

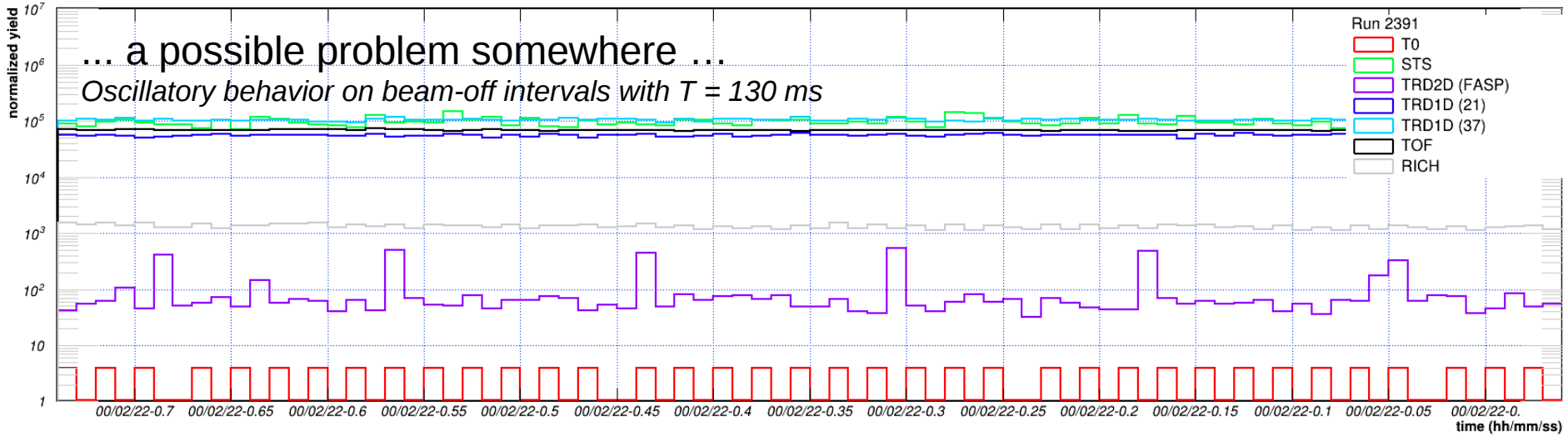
1. CBM : the cradle of new instrumental developments beside being the fastest
→ Dedicated to extending the MWPC technology

2. mCBM employ of intermediate trackers for lambda reconstruction
→ Dedicated to using precise tracking between STS and TRD to clean matching with ToF

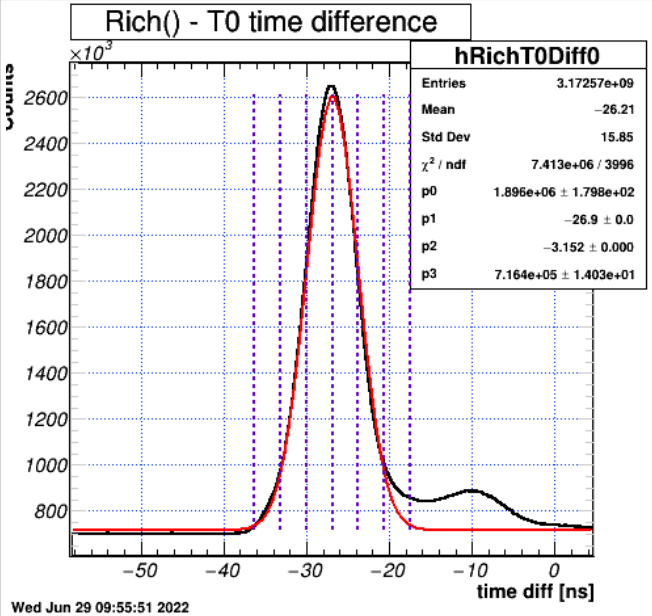
BACKUP

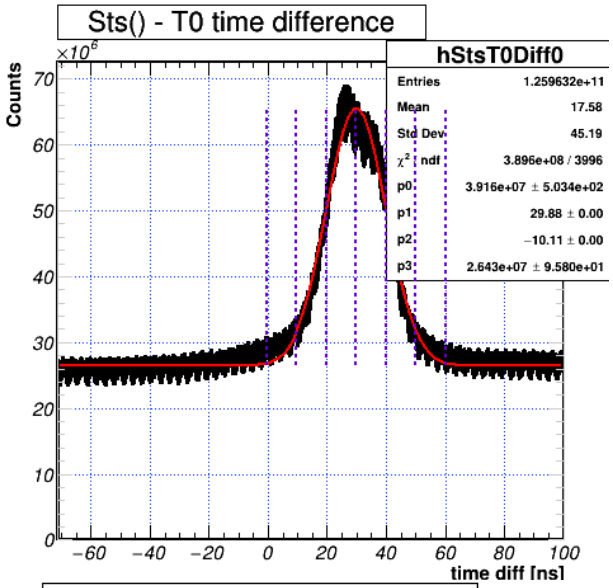
Data QA for the run

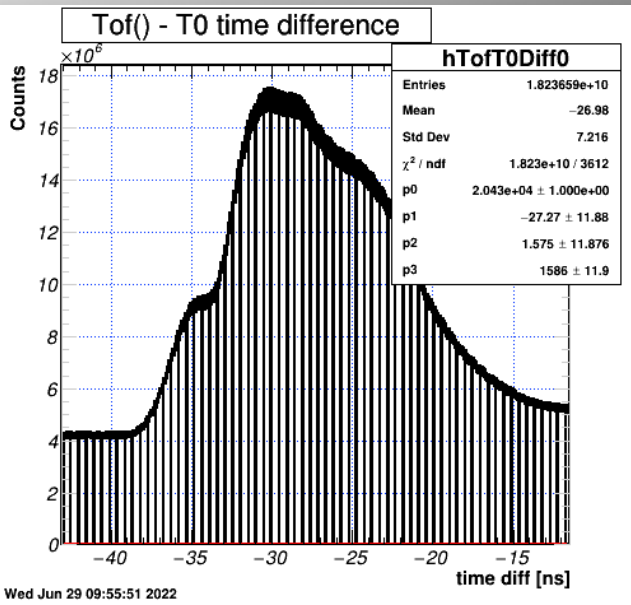


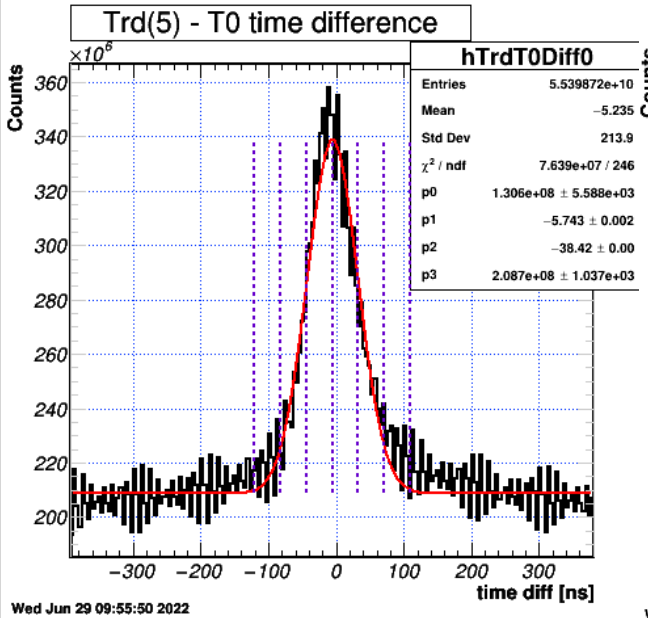


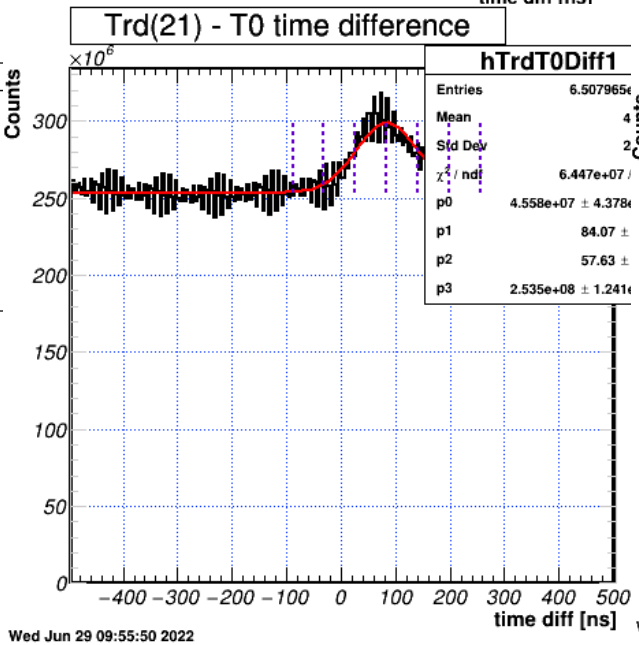
Time correlation

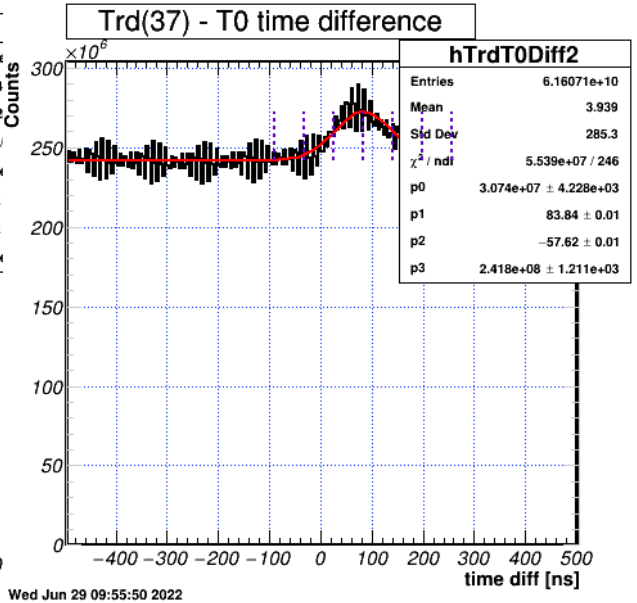




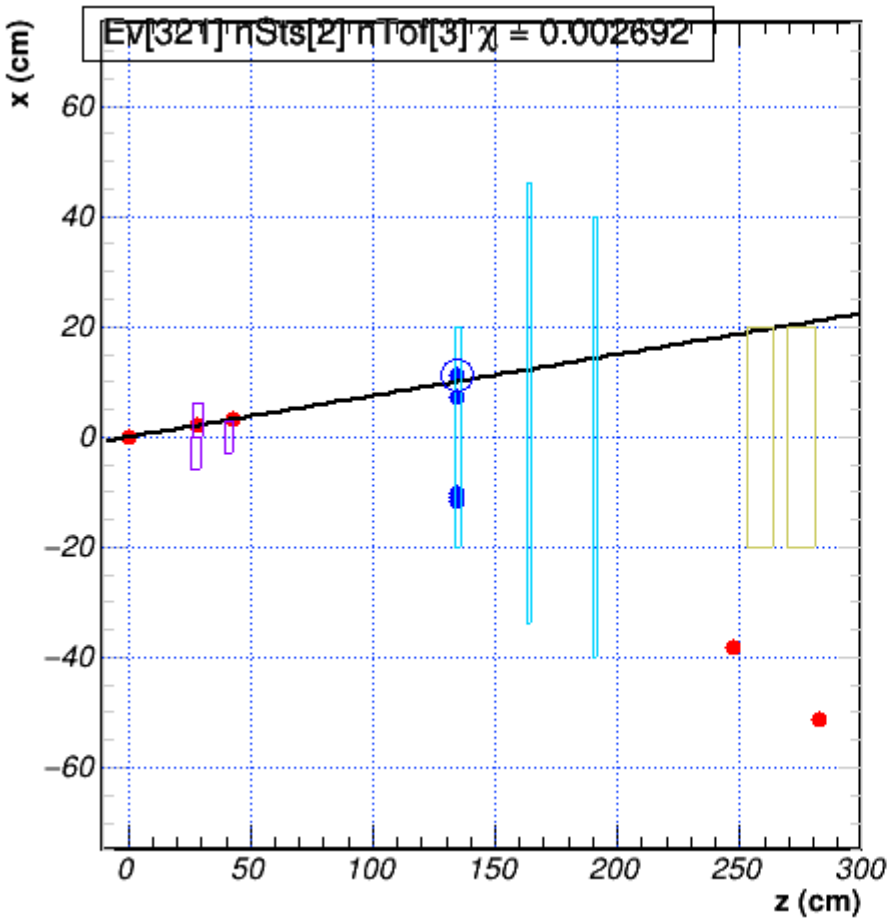


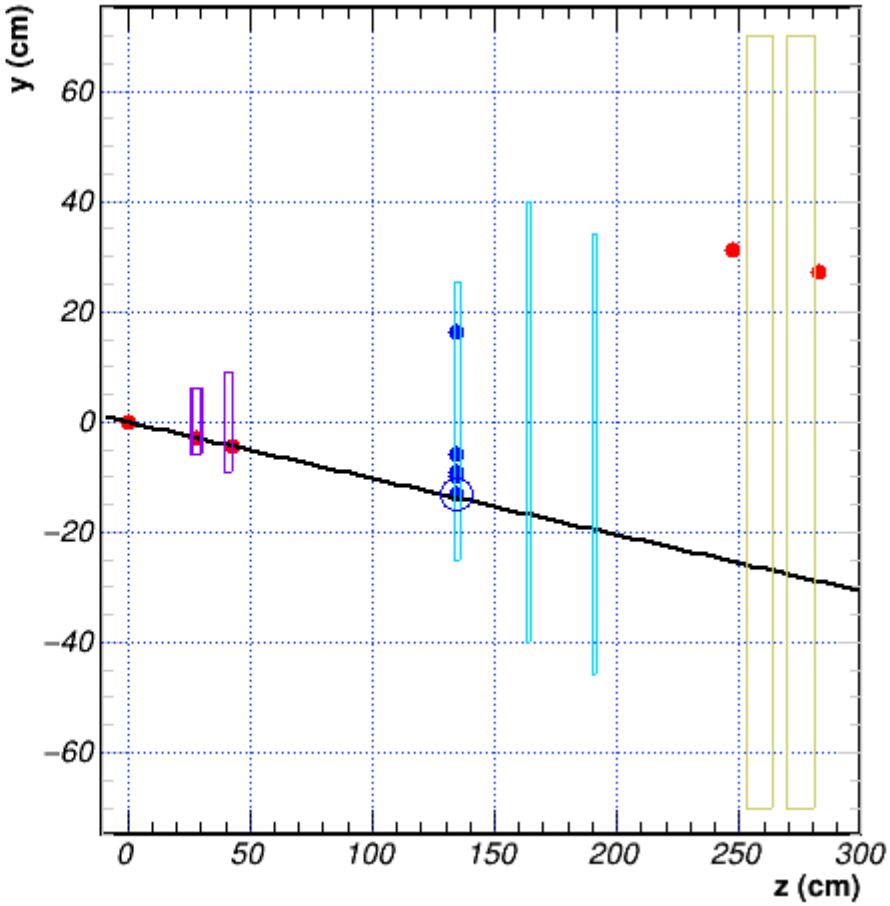






Track definition





Sts Track extrapolation