# Updated on reconstruction of ProtoDUNE – DP data

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Matching in 3D problem

- Have been using the "proper" PDDP geometry, i.e., with the drift along Y and 3D matching was not failing completely (0 matchted clusters between views)

- Switched to rotated PDDP geometry (drift along X) and the 3D matching started to work

- Matching in 3D relies on the drift coordinate, which is X for SP, while it is Y for DP with normal drift orientation

  - This is most likely the cause of failure of generating 3D tracks. The drift coordinate is not correct unless the rotated geometry of ProtoDUNE DP is used (with drift in X)

- Updated the "rotated" geometry to take into account the actual CRP numbering (Geometry/gdml/generate_protodunedphase_v2.pl)
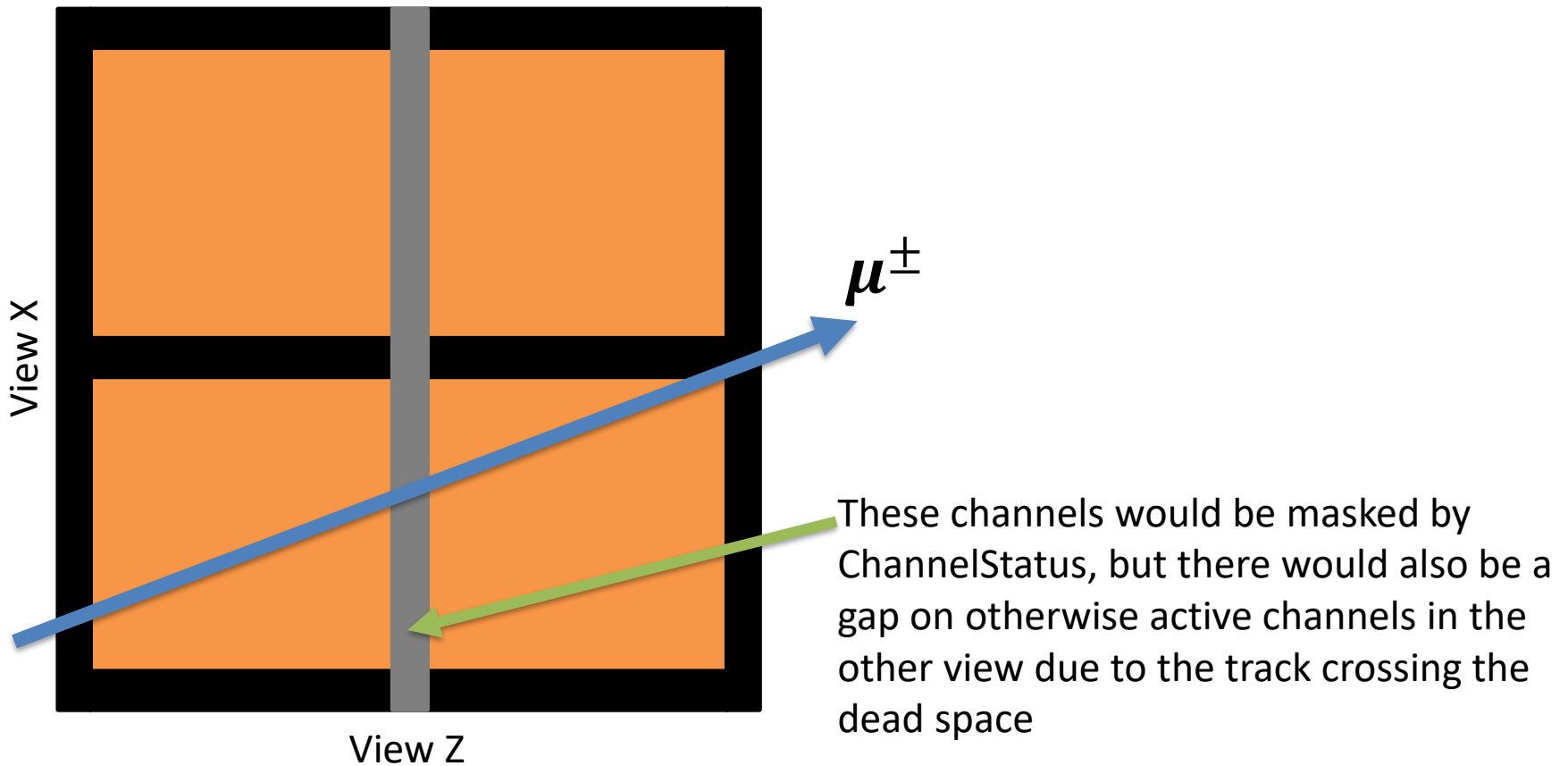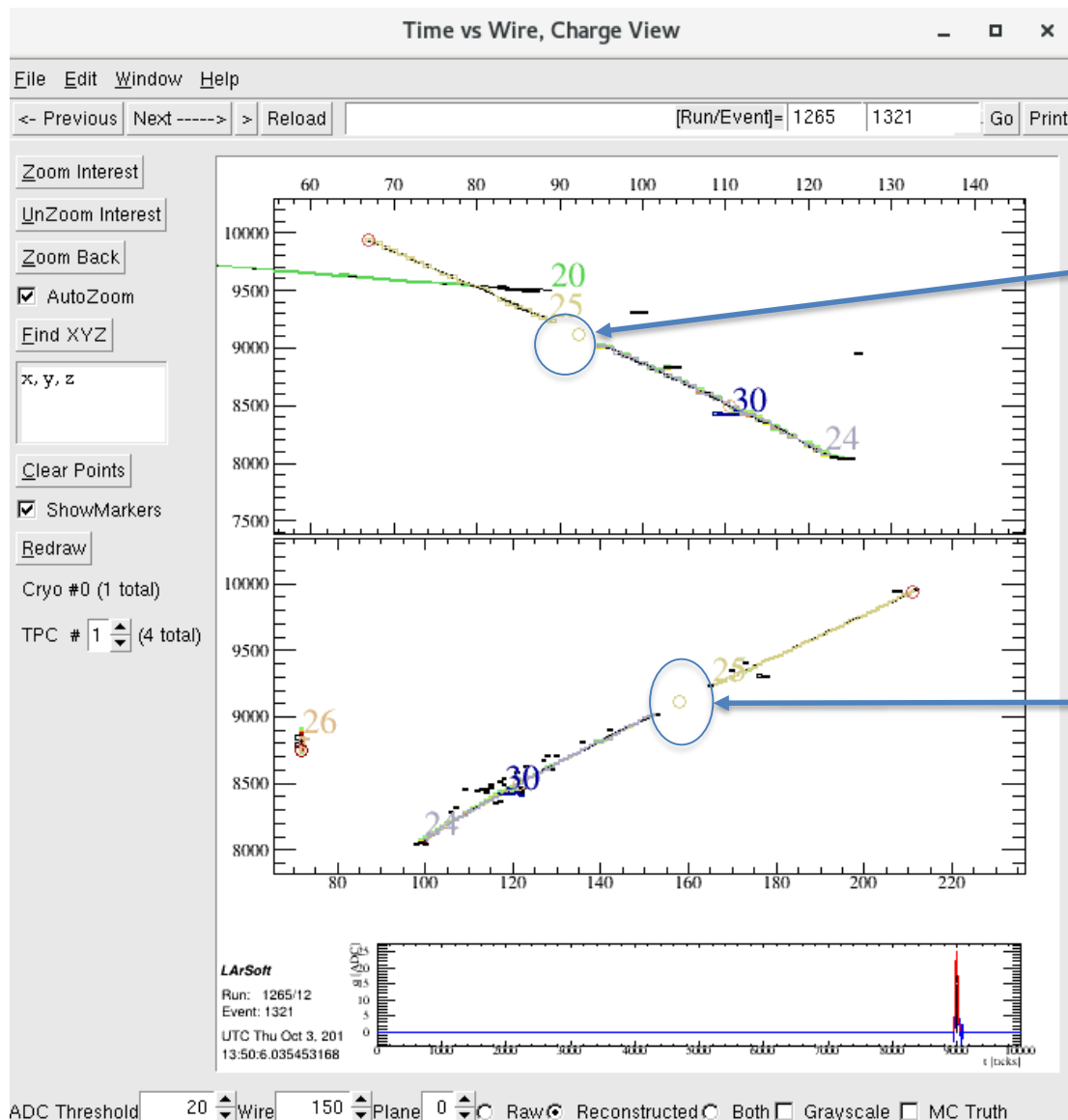
Rotated geometry
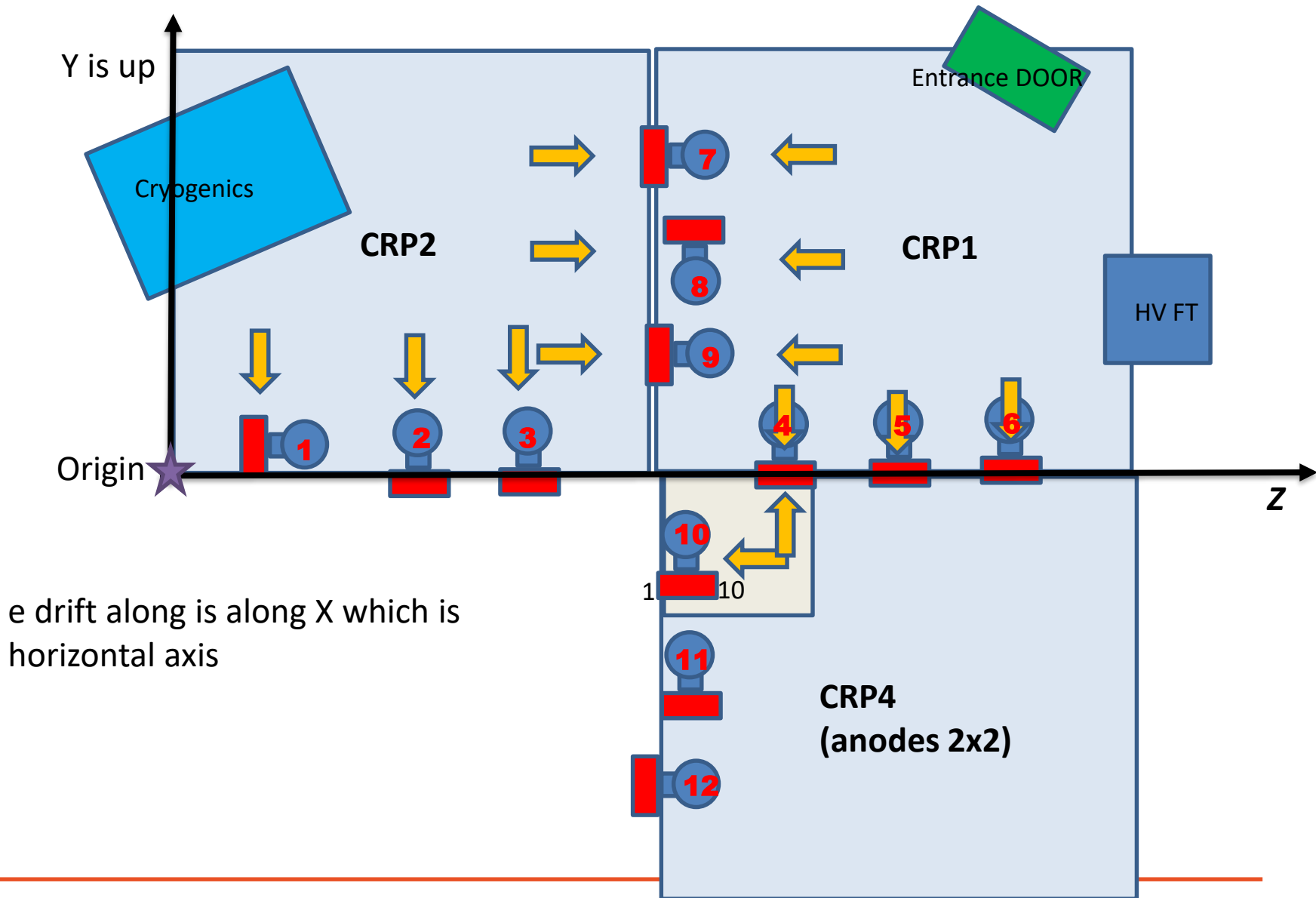
Event example
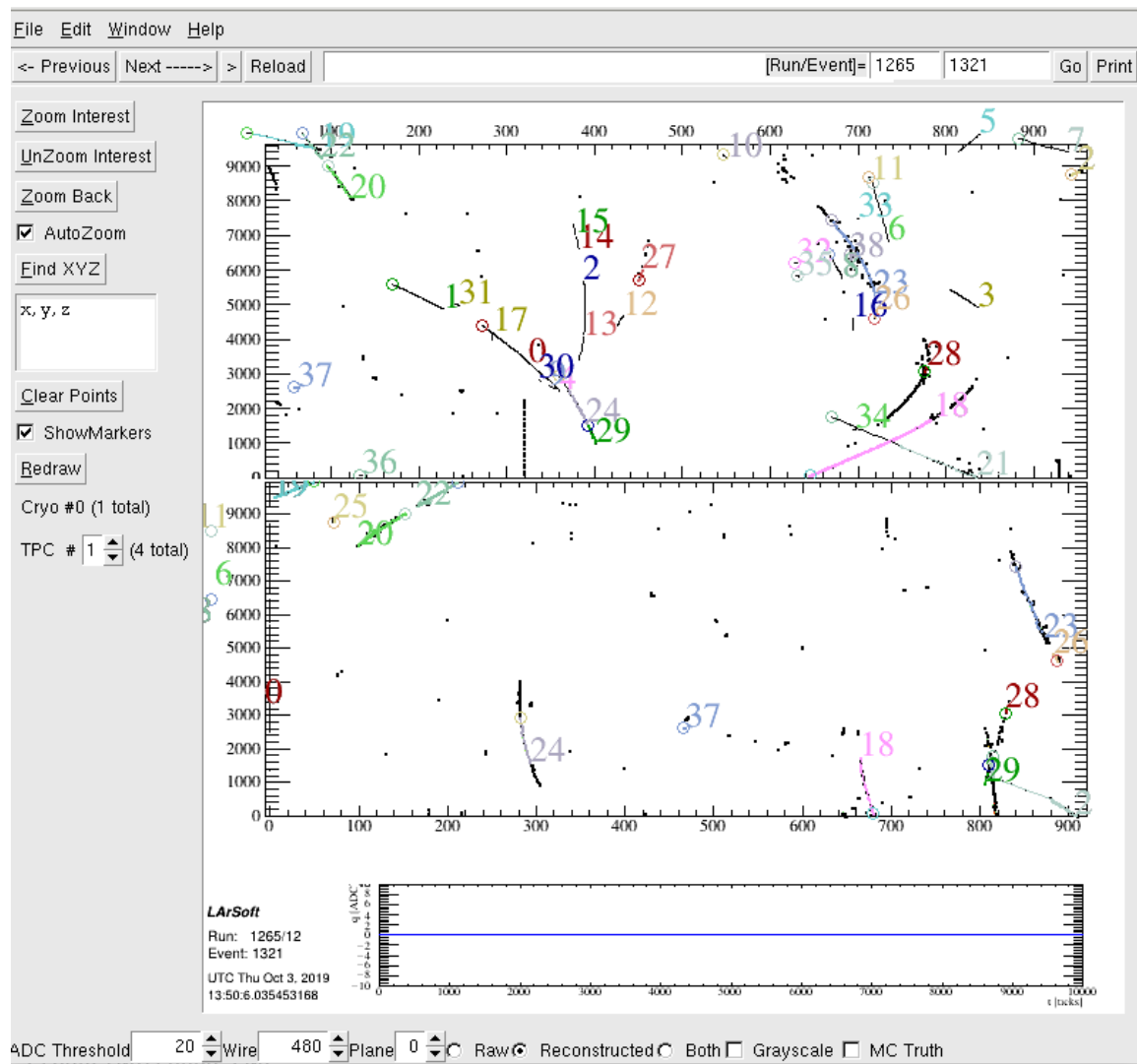
Many trajectories are broken up (missing hits, LEM borders …)
Visually could identify a number of mismatches (a segment of one track in one view is assigned to the wrong track in the other)
➔ To be optimized

LEM border effects

View X

View Z

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These channels would be masked by ChannelStatus, but there would also be a gap on otherwise active channels in the other view due to the track crossing the dead space

Track breaks at LEM border

In this view, the gap is too large and the track is broken

These channels are masked by channel status service

Conclusions

- For reconstruction to work still need to use rotated DP geometry (drift along X)

- The track reconstruction requires tuning to deal with LEM border effects

  - Even at the level of a single events see a number of mismatches between views

  - Needs to be fixed if one wants to get dQ/dx for example to look at LEM gain

- Ideally should be done with MC as well, but LEM borders were never part of the simulation

  - Also the field map of the current PDDP drift field configuration is not implemented