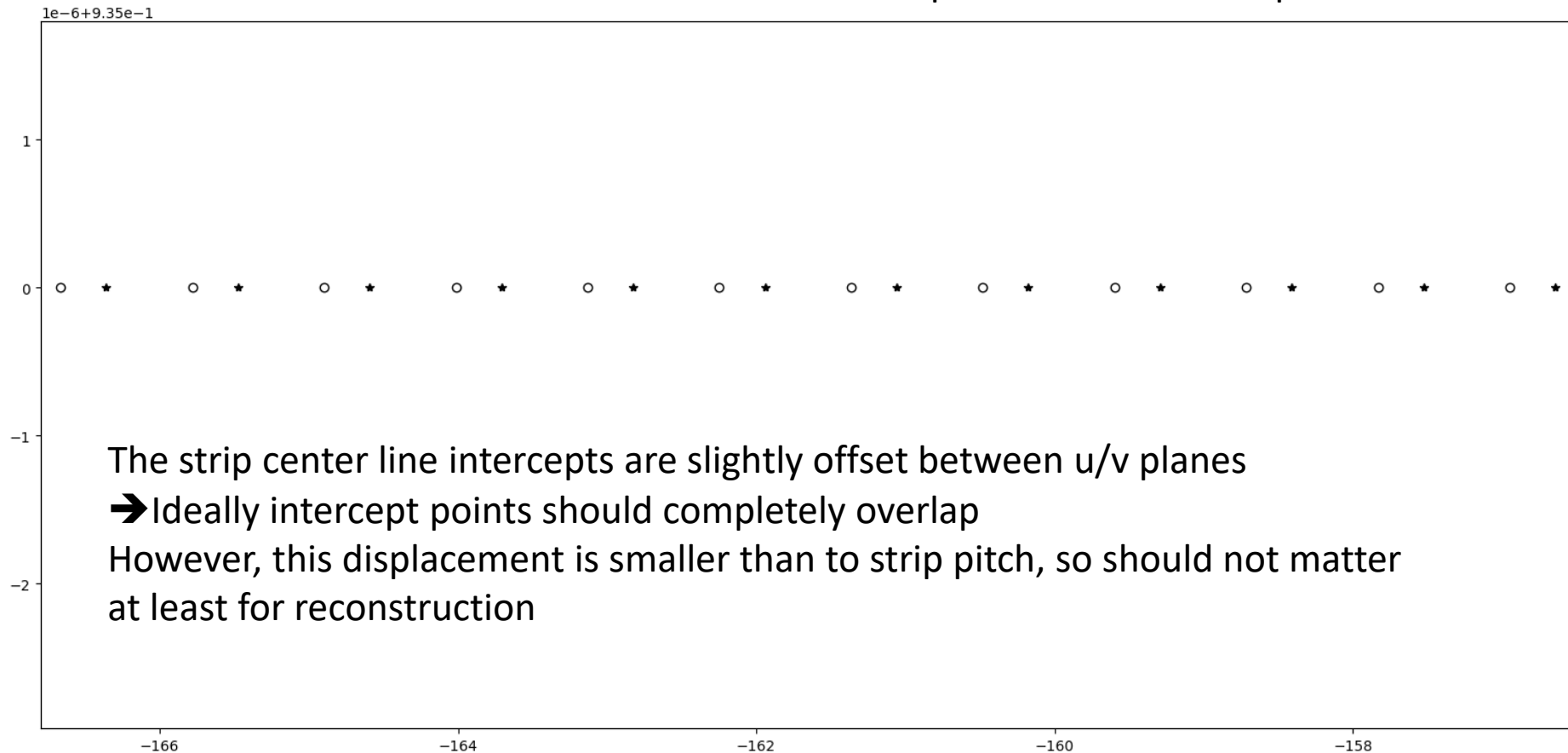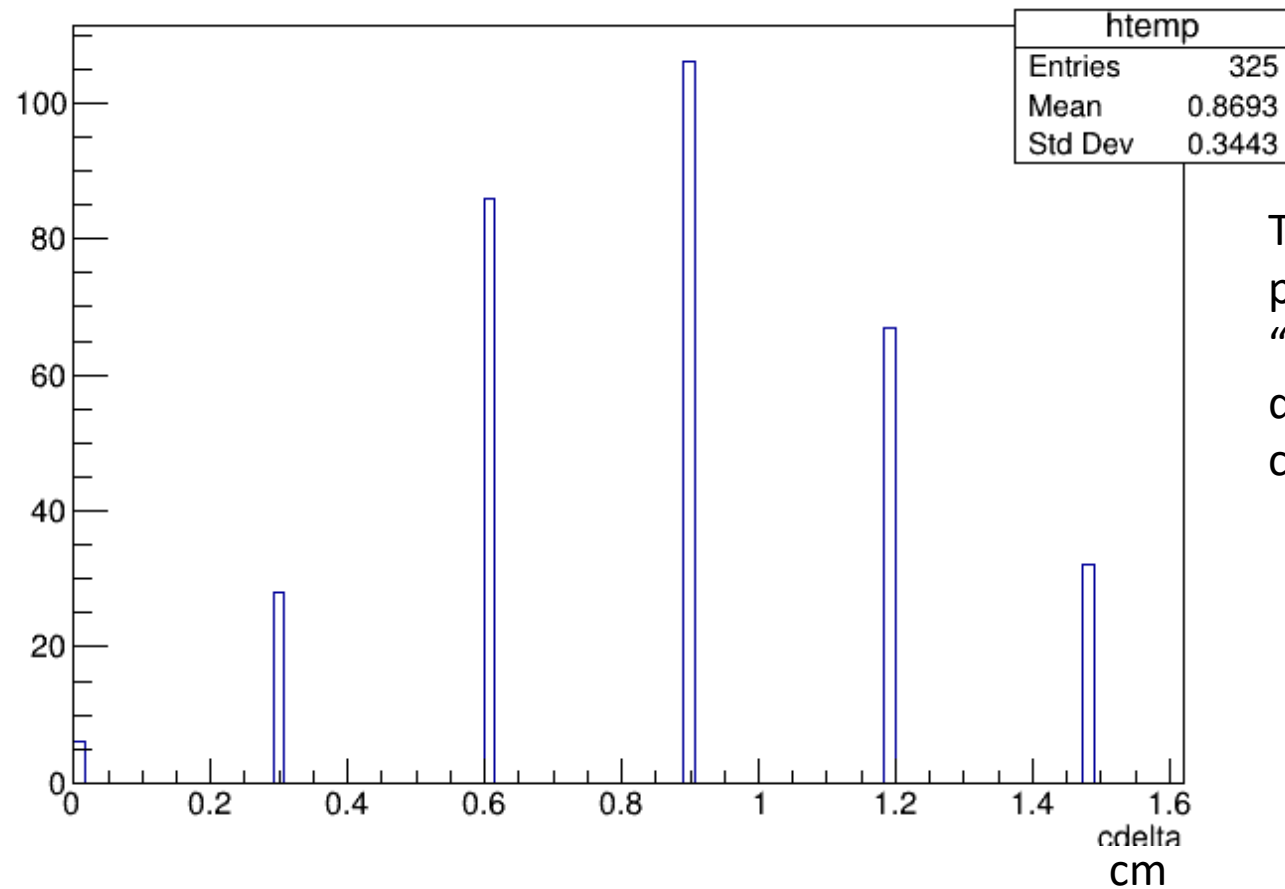# Discussion: what exists / missing

Geometry

- Geometry description exits for ProtoDUNE - VD

- Detailed validation:
  - Check inter-CRP distances and verify that they are compatible with engineering drawings / specifications from CRP consortium for alignment at cold
  - Check geometrical configuration of CRP strips
    - The strips are modelled as "wires" cylindrical objects of no (small) dimensions
    - These should represent the lines through strip centers
    - Check that the overlap between strip centers in different views is sensibly correct

Wire crossing points from [this](#) presentation on Ar39 selection tools for dataprep

Stars: intersection with a collection strip center line (==wire) of u-strip center line
Circles: intersection with a collection strip center line of v-strip center line

The strip center line intercepts are slightly offset between u/v planes
➜Ideally intercept points should completely overlap
However, this displacement is smaller than to strip pitch, so should not matter
at least for reconstruction

Delta of cluster position evaluated from col/ind1 and col/ind2

This is rather than expected, which probably means that the geometry "wire" pattern alignments has some discrepancy with the actual strip center positioning

Delta of cluster position evaluated from col/ind1 and col/ind2 in MC
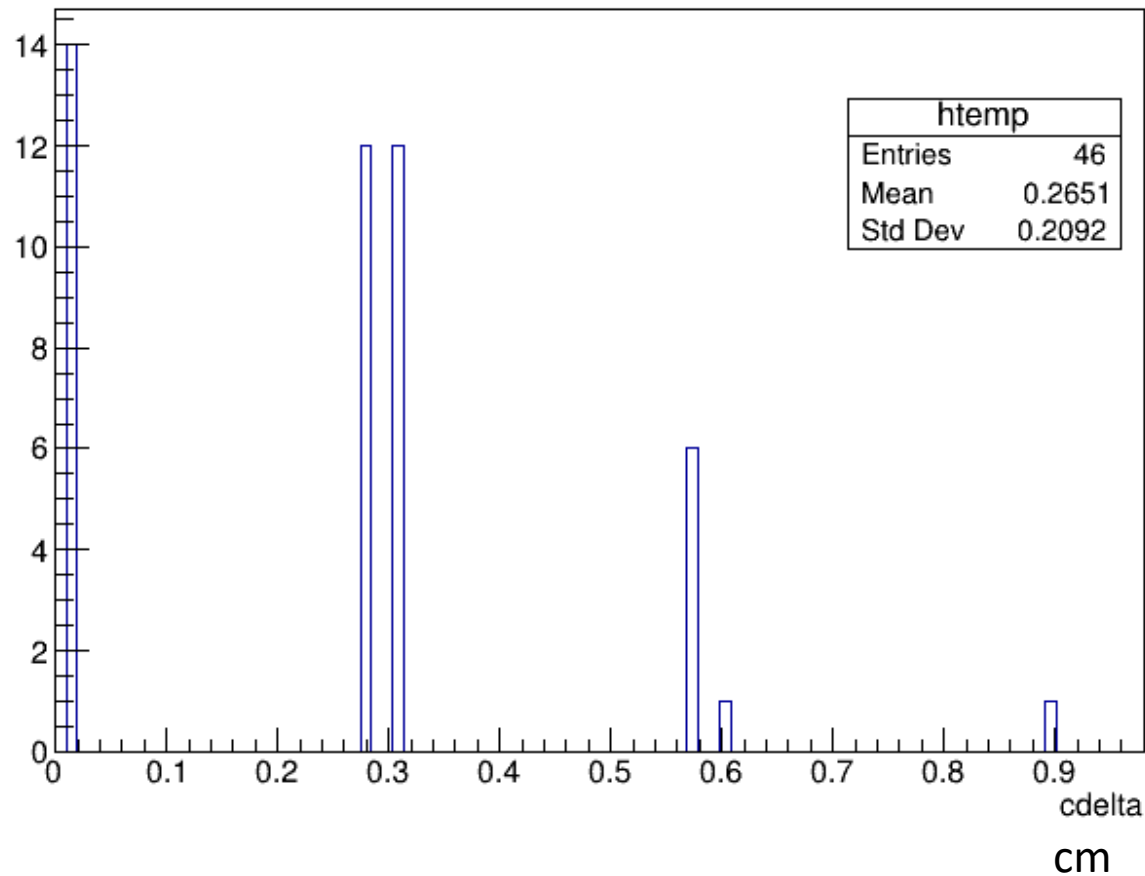
In MC this is difference looks better

Generator

- Cosmics (corsika) gen_protodunevd_cosmics.fcl exists
  - The generator also simulates radio logical backgrounds using protodunesp_39ar(etc.) tables
  - Need to set/check the dimensions of the active volume according to VD TPC configuration

- Beam gen_protodunevd_beam_p1GeV.fcl exits

- State of muon halo understanding / actual shielding configuration simulation?
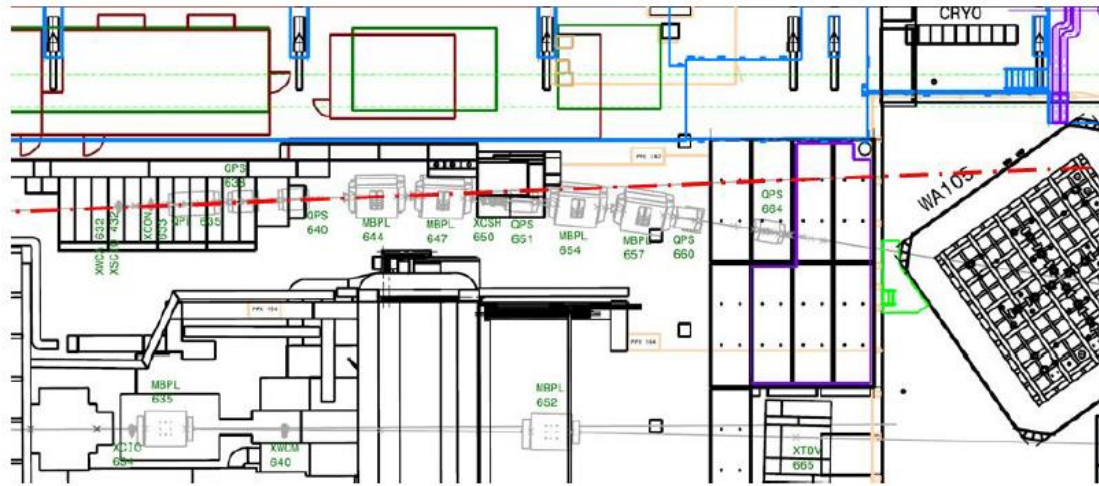
From [SPSC-SR-184](#) (2016)

FIG. 14: Muon halo: extrapolation of the H2 secondary beamline to the WA105 cryostat (dashed-dotted line)
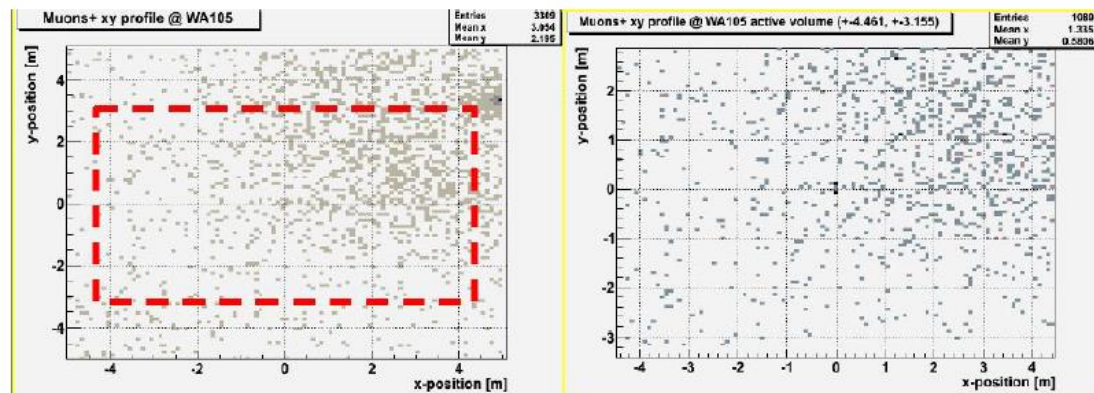

FIG. 15: Muon halo beam spot with respect to the WA105 active volume (left plot, dashed box) and its tails present in the WA105 active volume (right plot)

Background estimated at 2kHz rate for ProtoDUNE DP. This is simultaneous with the beam

Geant4 simulation

- Harmonize where possible various simulation parameters (e.g., diffusion coefficients) between prototypes

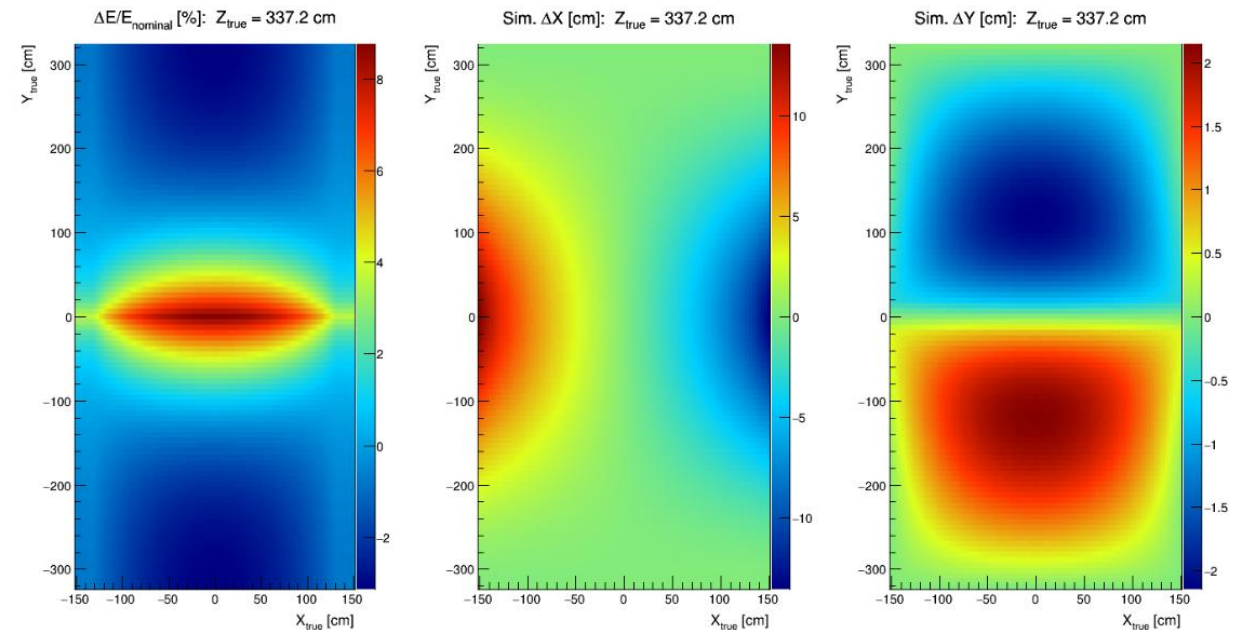- State of simulation of space charge effects?

SCE slides from M. Mooney July. 2022 DRA

ProtoDUNE-VD (500 V/cm)
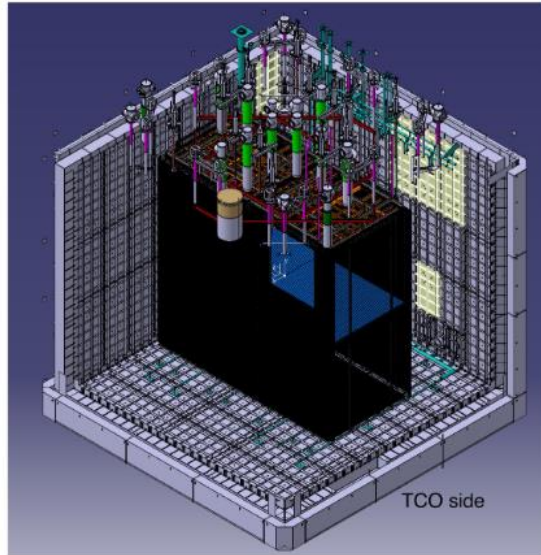
♦ Drift coordinate: Y

♦ X dimensions: [-149.75 cm, 149.75 cm]

♦ Y dimensions: [-321.0 cm, 321.0 cm] (max drift: 321.0 cm)

♦ Z dimensions: [0.0 cm, 674.40 cm]

♦ Simulation maps are in hand, just need more precise geometry info for ProtoDUNE-VD to implement in LArSoft

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TPC response simulation

- Detsim [protodunevd_refactored_detsim.fcl](#) / [protodunevd_detsim.fcl](#) exist
    - What is the difference between two?

- Y drift detsim [: protodunevd_refactored_detsim_driftY.fcl](#)

- What is the status of the integration for TDE / BDE shaping functions as a function of CRP #?

- Is the normalization of reconstructed dE/dx correct in MC?

Status of light simulation

- Discussed tomorrow?

Miscellaneous

- Switch to passing calibrated samples to WCL signal processing
  - Currently use ADC after CNR and pedestal subtraction and WCL returns 200e/unit normalized signals after deconvolution
  - Dataprep supports applying calibration constants already (done for ProtoDUNE SP). Then one would pass data in ke units to WCL. This is more transparent to end-users

- Documentation on dunewiki:
  - Relevant geometry info for Module 0, channel range assignments between CRPs / views, configuration of different services …