

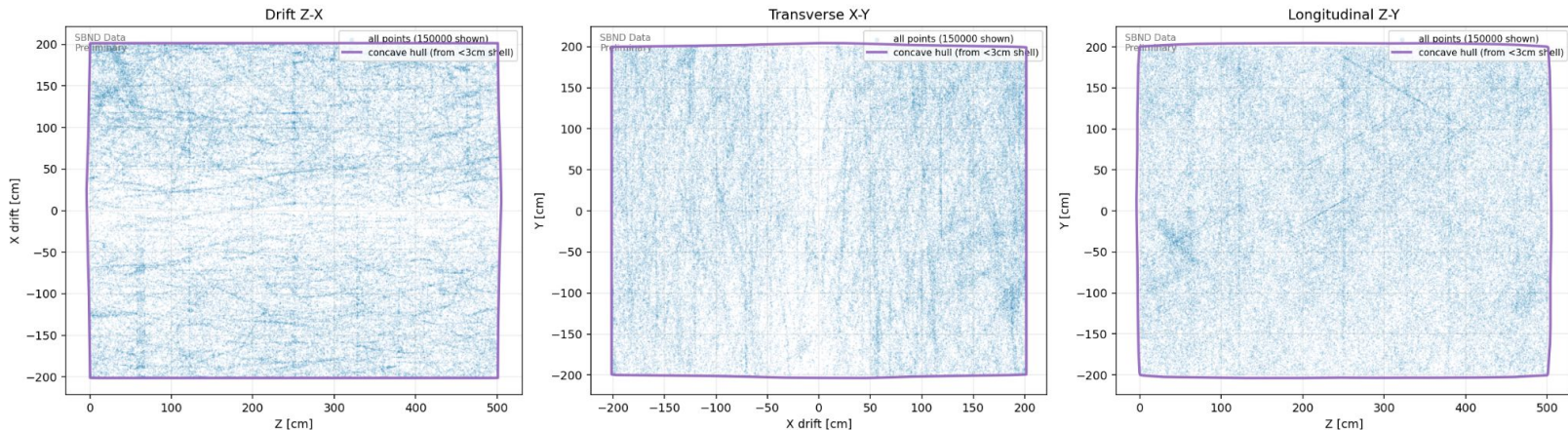
Semantic NuGraph vs traditional comparison is still ongoing

- Last time, I used a dataset from Avinay that included `reco_cluster_id` as an input feature, so I could just use that for comparisons. Now I need to know whether the traditional algorithm decided a hit was cosmic or nu, which isn't available in that dataset. So I'm running the reconstruction pipeline and the traditional clustering algorithm on a new dataset (`mc_MCP2025B_prodgenie_corsika_proton_rockbox_sbnd_CV_gen_g4_detsim_reco1_sbnd`) which is taking a while but I'm making progress.
- One snag: NuGraph's semantic head decides whether every hit belongs to a neutrino or cosmic. The traditional algorithm decided cluster-by-cluster whether the cluster is a neutrino or cosmic. The closest comparison I can do is "projecting" the traditional algorithms results down to the component hits and comparing every hit.

Initial APA structure inspection using real data

- Get deconvolved waveforms from the dataset Lane used to get SCE in technote (data MCP2025B CrossingMuon FullRun1 AfterLight crossingmuon v10 06 03)
- Apply imaging, clustering, charge-light matching to correct T0 (wcls-img-clus-matching-xin-data.fcl), filtering ON
- Apply SCE using Avinay's framework in WCT
- Take concave hull using scipy and plot

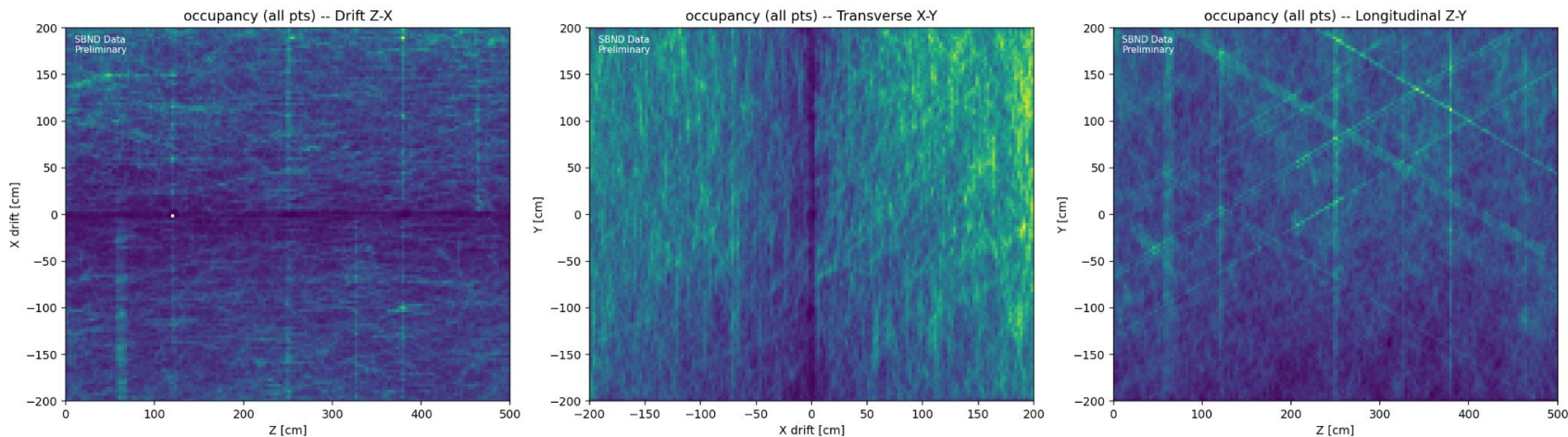
SBND QL-matched tracks -- 1659 events. hull from $\leq 3\text{cm}$ shell; ALL 41234309 pts shown. $\text{vol}=8.202\text{e}+07\text{ cm}^3$



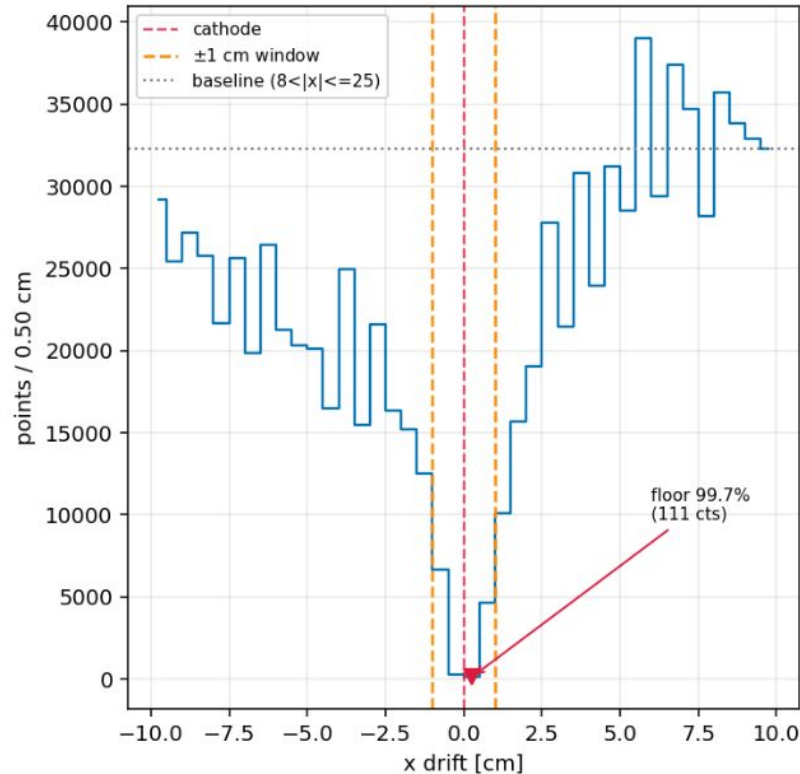
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SBND QL-matched tracks -- occupancy, 1659 events, all 41234309 points



Cathode is filled in - how accurate is QL matching?



3D view

http://127.0.0.1:3000/sce-plots/surface_map_big/surface_hull_3d.html?vscodc-livepreview=true

SBND Data -- QL-matched tracks, 3D concave hull (1659 events) drag=rotate, scroll=zoom

