

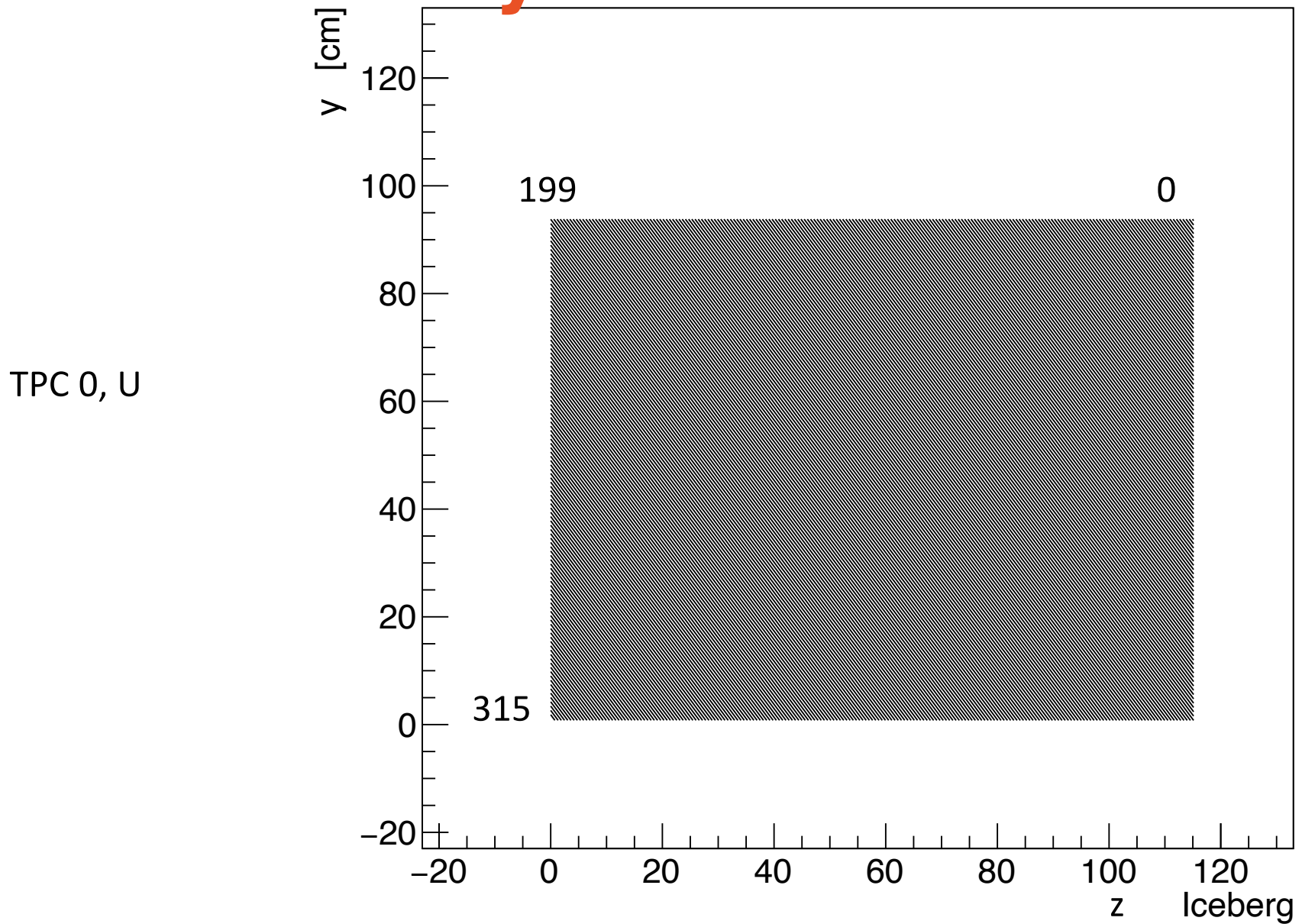
ICEBERG Single Gen+Stab at a Reco using Geometry V2

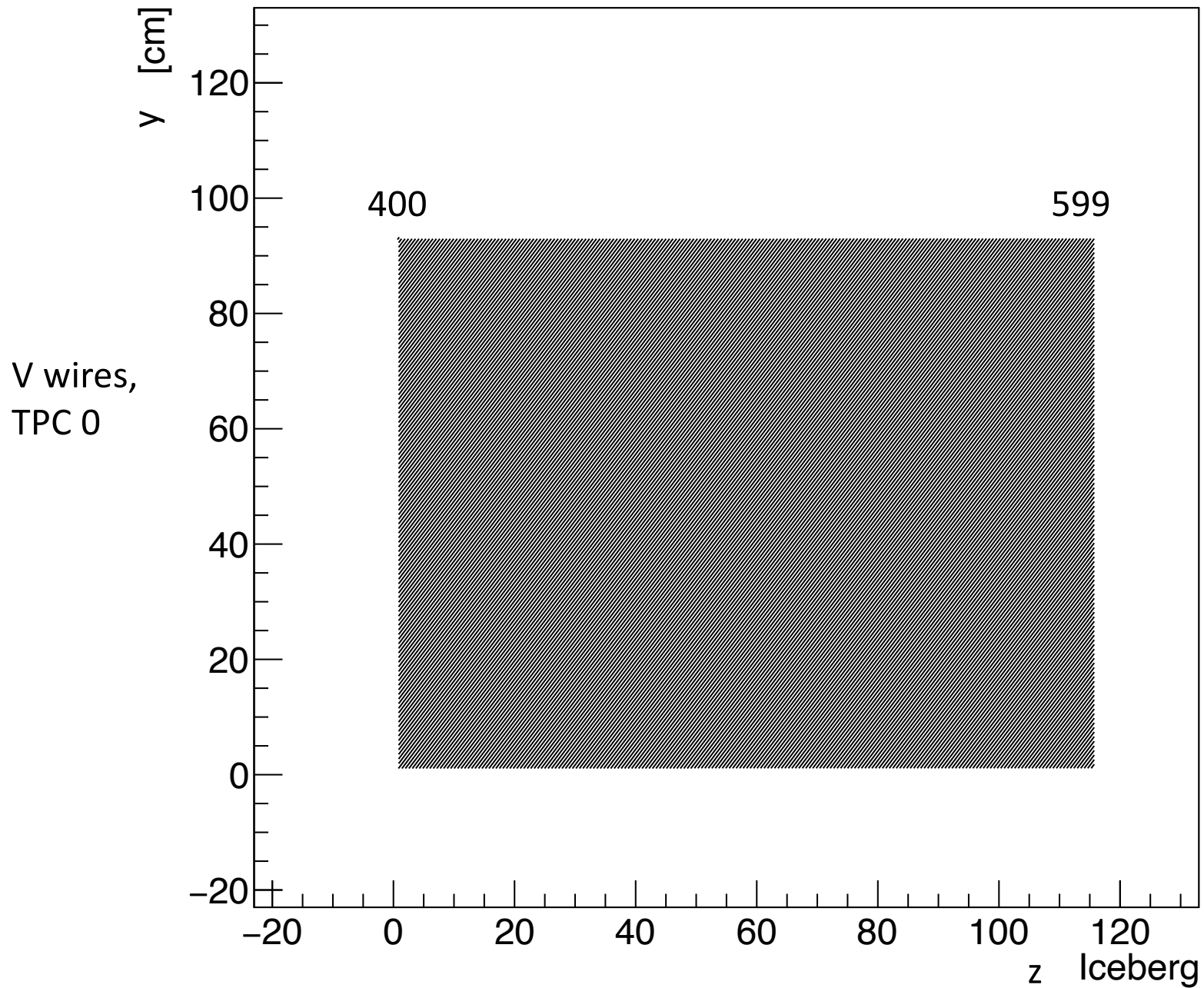
Tom Junk

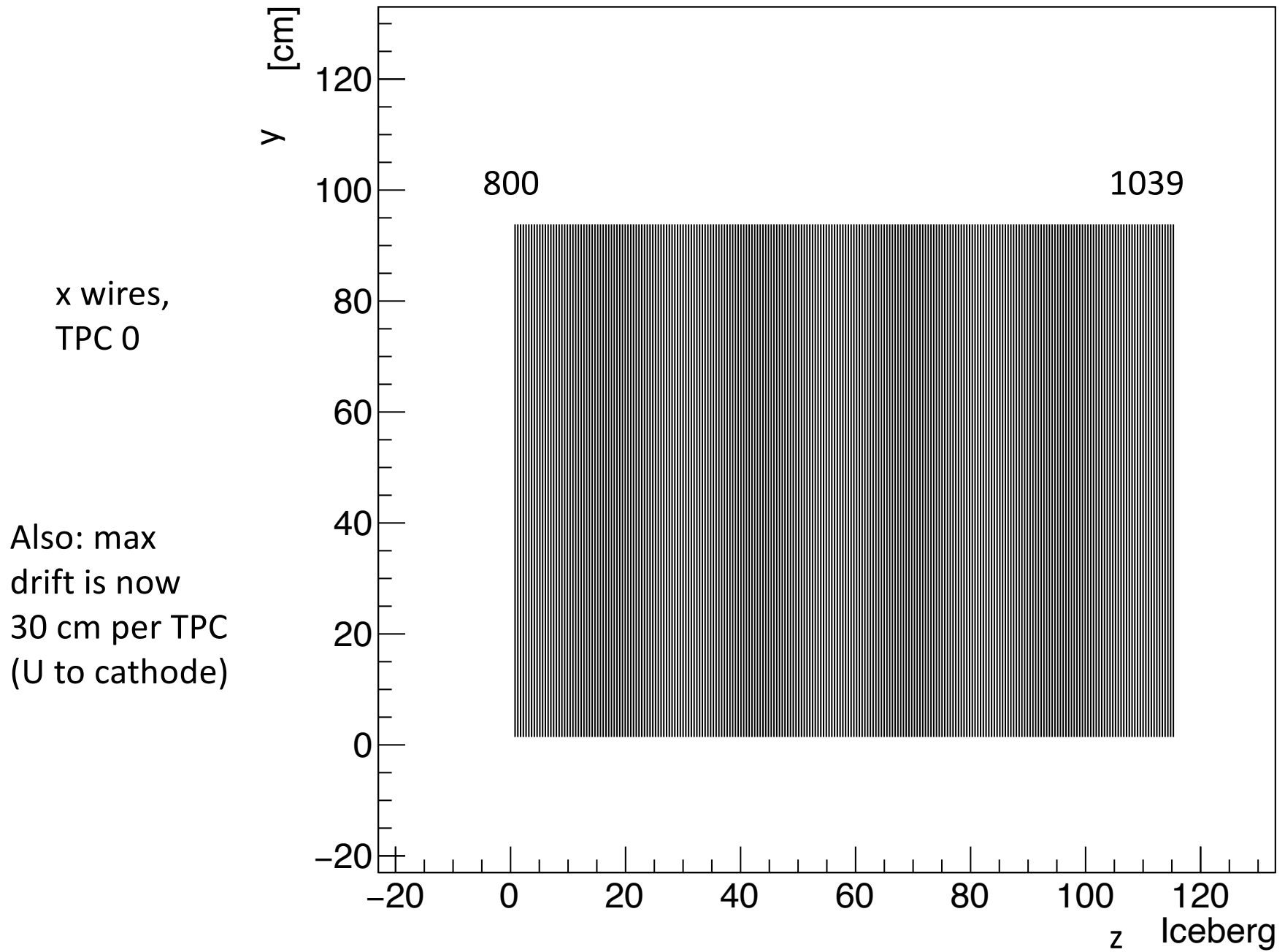
ICEBERG AI/ML Meeting

April 5, 2023

New Geometry





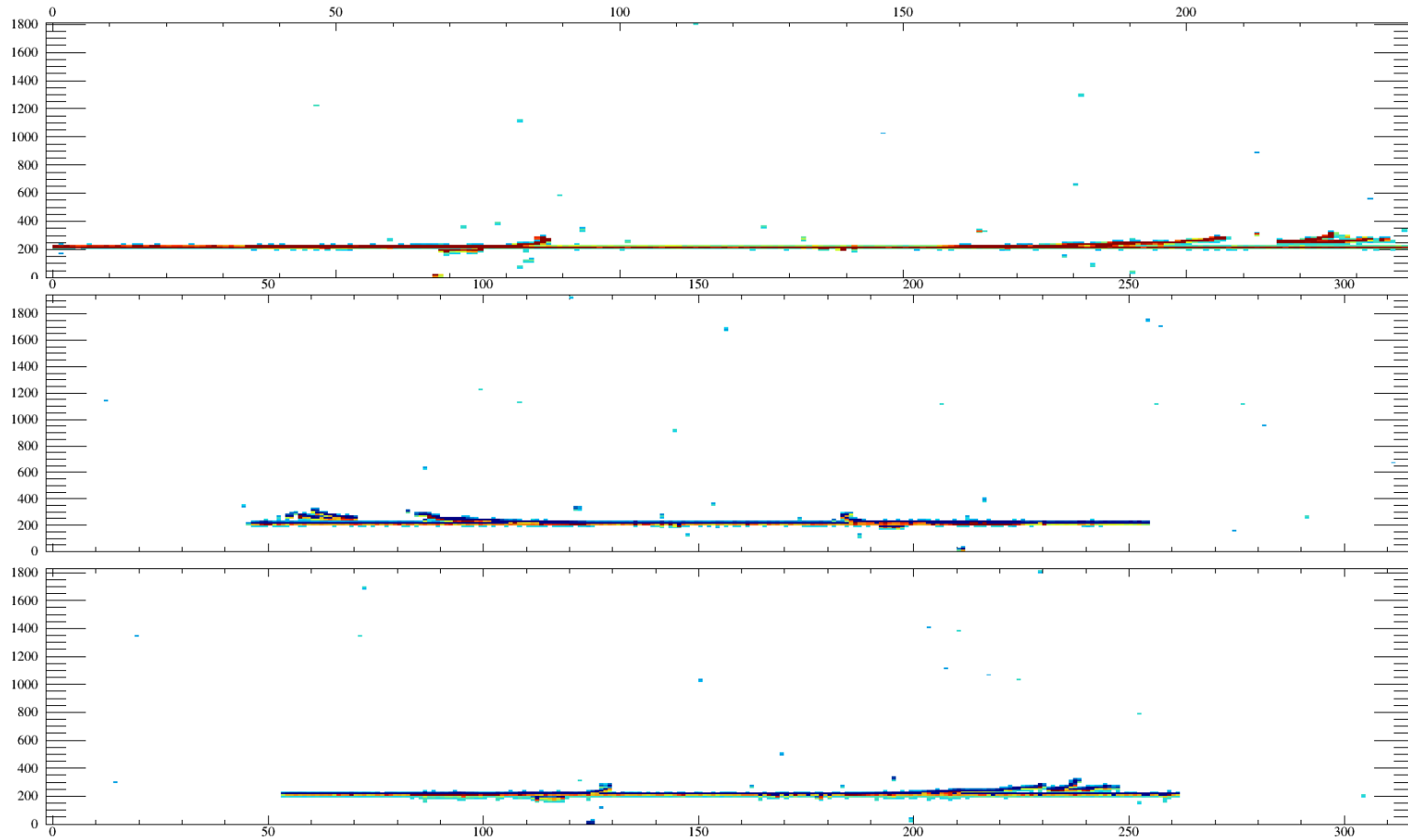


Changes to the sorting code

- One of the reasons the v1 geometry had an APA that was too tall was the algorithm, sorting the wires, did so by making assumptions about how a 6m tall APA was laid out.
- Wire centers in Y were used to sort the induction-plane wires.
- Now had to use wire centers in Z and switch directions based on which plane and which TPC.
- Some fragility is present in the channel sorter code – floating-point numbers are compared for equality to determine what plane a wire is in (regular APA). Not in the new ICEBERG sorter.

A Simulated Muon

prodsingle_iceberg.fcl
particle gun coordinates adjusted
to point to smaller detector.



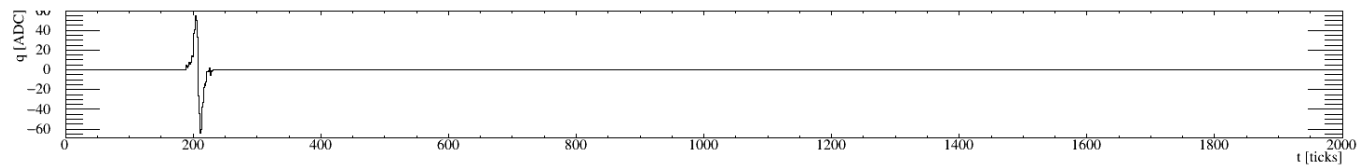
LArSoft

Run: 1/0

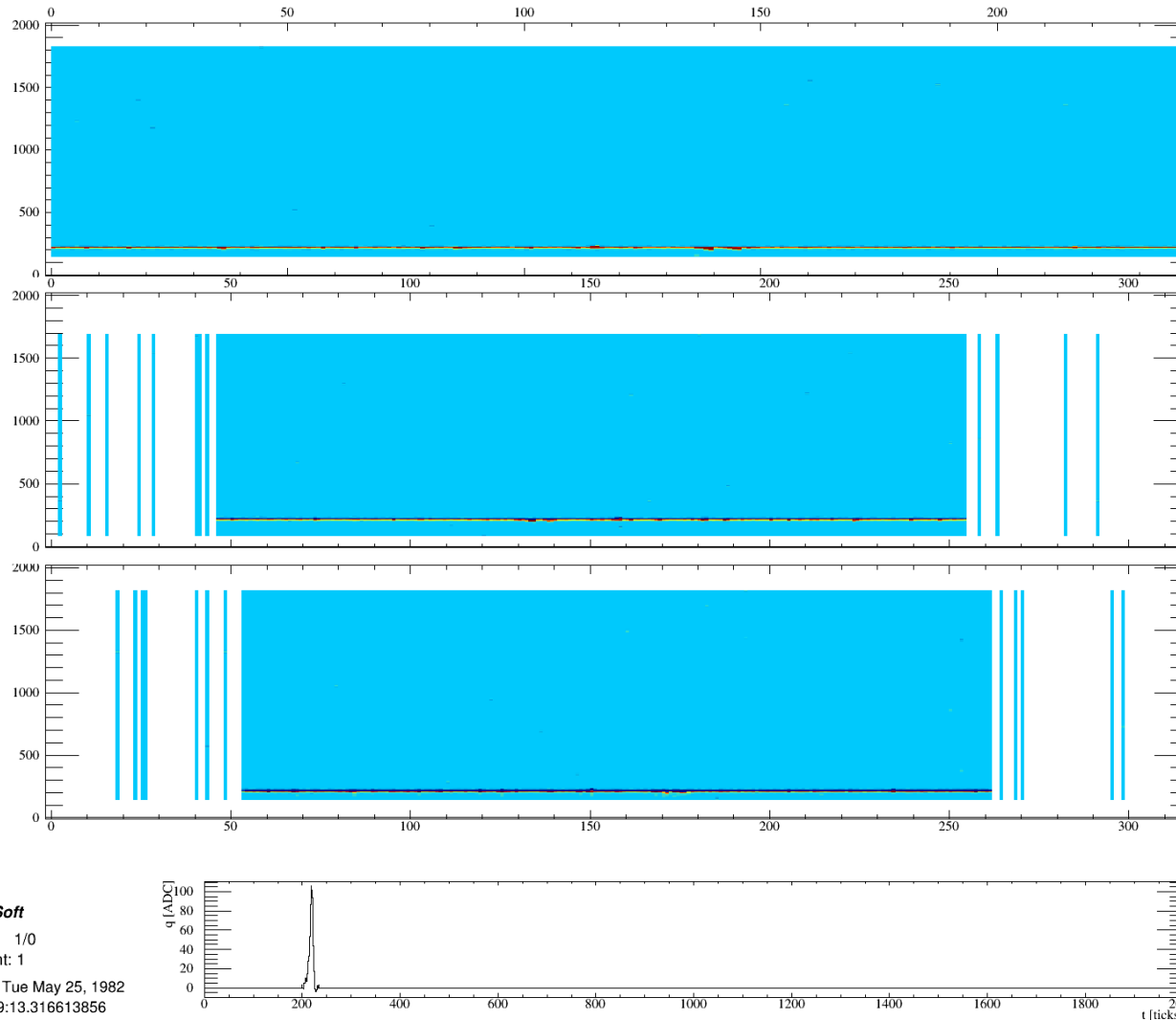
Event: 1

UTC Fri May 14, 1982

10:42:51.091701048



Another Simulated Muon



Raw Digits are produced for channels that have signals above threshold

Induction-plane channels on other side of TPC have noise only.

LArSoft
 Run: 1/0
 Event: 1
 UTC Tue May 25, 1982
 19:39:13.316613856

A Stab at Reco for MC

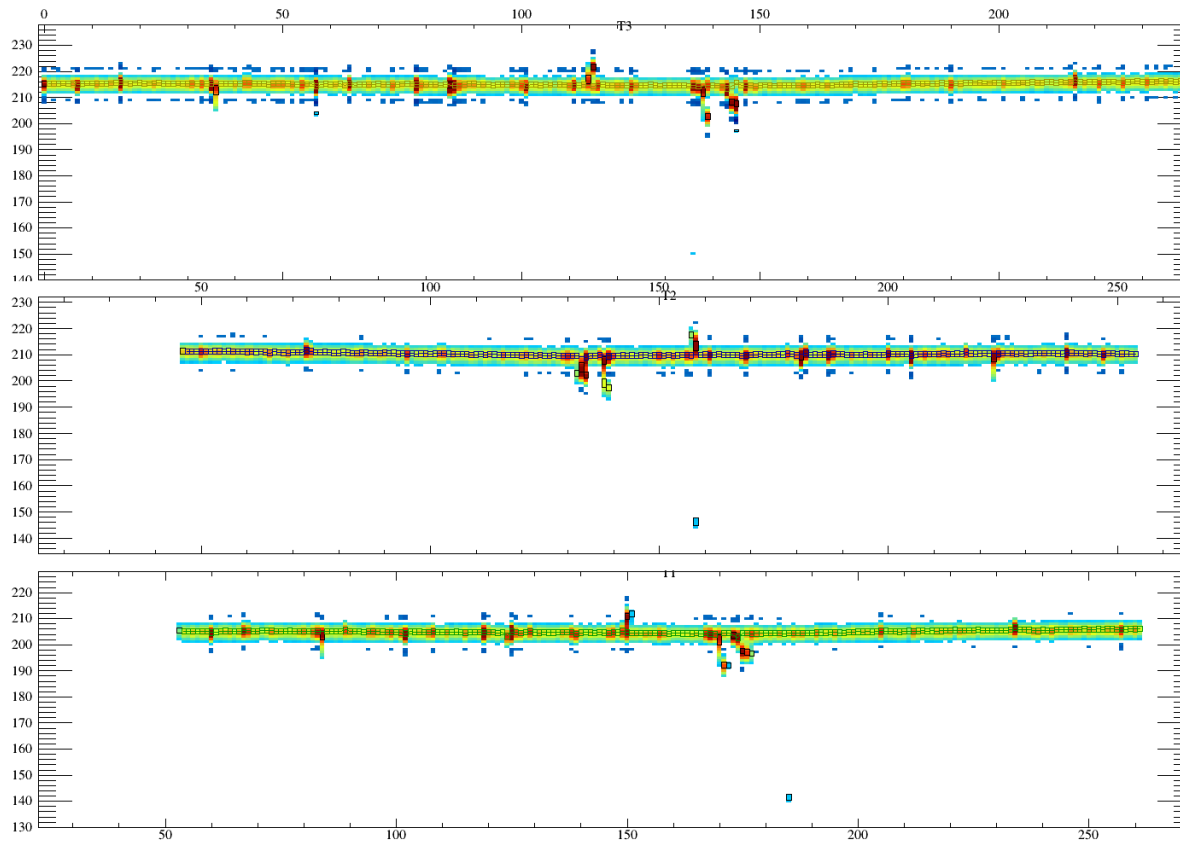
legacy_reco_iceberg.fcl

(pushed to dunesw
develop on April 3).

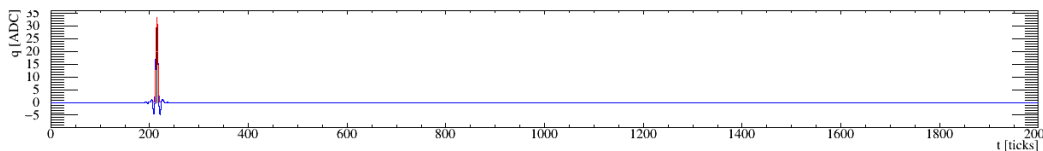
Based on
standard_reco_dune10kt_legacy.fcl

but with the geometry
changed to Iceberg (v2)
and photon detector
reco removed.

Hits and wires shown.



LArSoft
Run: 1/0
Event: 1
UTC Tue May 25, 1982
19:39:13.316613856



Reco Data Products

Size in bytes Fraction Data Product Name

277357	0.267	recob::Wires_caldata__Reco.
65125	0.063	sim::SimChannels_largeant__SinglesGen.
39831	0.038	simb::MCParticles_largeant__SinglesGen.
36044	0.035	raw::RawDigits_daq__SinglesGen.
31128	0.030	recob::Hits_hitfd__Reco.
30967	0.030	recob::Hits_linecluster__Reco.
30867	0.030	recob::Hits_gaushit__Reco.
28182	0.027	recob::Hits_trajcluster__Reco.
21615	0.021	anab::Calorimetrys_pandoracalo__Reco.
20415	0.020	anab::Calorimetrys_pmtraffitcalo__Reco.
20183	0.019	anab::Calorimetrys_pmtrafittccalo__Reco.
20108	0.019	anab::Calorimetrys_pmtracktccalo__Reco.
17955	0.017	recob::Tracks_pandoraTrack__Reco.
12614	0.012	recob::Tracks_pmtrafittc__Reco.
12417	0.012	recob::Tracks_pmtraffit__Reco.
12218	0.012	recob::Tracks_pmtracktc__Reco.
12023	0.012	simb::MCTruths_generator__SinglesGen.
11685	0.011	4anab::FeatureVectors_emtrkmichelid_emtrkmichelrecobHit__Reco.
9714	0.009	recob::SpacePoints_pandora__Reco.
9068	0.009	recob::Hitrecob::Trackrecob::TrackHitMetaart::Assns_pmtracktc__Reco.
9014	0.009	recob::SpacePoints_pmtraffit__Reco.
8984	0.009	recob::SpacePoints_pmtrafittc__Reco.
8850	0.009	recob::SpacePoints_pmtracktc__Reco.
6033	0.006	recob::Clusters_blurredcluster__Reco.
5981	0.006	recob::Clusters_emtrkmichelid__Reco.
5945	0.006	recob::Clusters_trajcluster__Reco.
5900	0.006	recob::Clusters_linecluster__Reco.
5817	0.006	recob::Clusters_pandora__Reco.
5680	0.005	recob::Clusters_trkshowersplit__Reco.
4485	0.004	recob::Hitrecob::Trackrecob::TrackHitMetaart::Assns_pandoraTrack__Reco.
4482	0.004	recob::Hitrecob::Trackrecob::TrackHitMetaart::Assns_pmtraffit__Reco.
4388	0.004	recob::Showers_pandoraShower__Reco.
4352	0.004	recob::Hitrecob::Trackrecob::TrackHitMetaart::Assns_pmtrafittc__Reco.
4349	0.004	recob::Showers_trajcluster__Reco.
4267	0.004	recob::Showers_emshower__Reco.

Reco Data Products cont'd

4246 0.004 anab::Calorimetrys_pmtrackcalo__Reco.
4243 0.004 recob::Slices_pandora__Reco.
4153 0.004 recob::Hitrecob::SpacePointvoidart::Assns_pmtraffit__Reco.
4047 0.004 recob::Hitrecob::SpacePointvoidart::Assns_pmtraffitc__Reco.
4046 0.004 recob::Hitrecob::SpacePointvoidart::Assns_pmtracktc__Reco.
4002 0.004 recob::Hitrecob::SpacePointvoidart::Assns_pandora__Reco.
3868 0.004 recob::Hitrecob::Wirevoidart::Assns_linecluster__Reco.
3859 0.004 recob::Hitrecob::Wirevoidart::Assns_trajcluster__Reco.
3822 0.004 recob::Hitrecob::Wirevoidart::Assns_hitfd__Reco.
3683 0.004 art::RNGsnapshots_rns__SinglesGen.
3592 0.003 recob::Hitrecob::Wirevoidart::Assns_gaushit__Reco.
3562 0.003 recob::Tracks_pandoraShower__Reco.
3528 0.003 recob::EndPoint2Ds_trajcluster__Reco.
3526 0.003 recob::EndPoint2Ds_linecluster__Reco.
3504 0.003 raw::RawDigitrecob::Wirevoidart::Assns_caldata__Reco.
3473 0.003 recob::Tracks_pmtrack__Reco.
3088 0.003 recob::Hitrecob::Trackvoidart::Assns_pandoraTrack__Reco.
3055 0.003 recob::Hitrecob::Trackvoidart::Assns_pmtraffit__Reco.
3027 0.003 recob::Vertexs_pmtraffitc__Reco.
3021 0.003 recob::Vertexs_trajcluster__Reco.
3013 0.003 recob::Hitrecob::Trackvoidart::Assns_pmtraffitc__Reco.
3010 0.003 recob::Hitrecob::Trackvoidart::Assns_pmtracktc__Reco.
3001 0.003 recob::Vertexs_pandora__Reco.
2995 0.003 recob::Vertexs_pmtracktc__Reco.
2988 0.003 recob::Vertexs_pmtraffitc_kink__Reco.
2980 0.003 recob::Vertexs_pmtraffitc_node__Reco.
2962 0.003 recob::Vertexs_pmtraffit_node__Reco.
2958 0.003 recob::Vertexs_pmtracktc_kink__Reco.
2957 0.003 recob::Vertexs_pmtracktc_node__Reco.
2952 0.003 recob::Vertexs_pmtraffit_kink__Reco.
2930 0.003 recob::Vertexs_pmtrack_kink__Reco.
2927 0.003 recob::Vertexs_pmtrack_node__Reco.
2926 0.003 recob::Vertexs_linecluster__Reco.
2887 0.003 recob::Vertexs_pmtraffit__Reco.
2877 0.003 recob::Clusterrecob::Hitvoidart::Assns_emtrkmichelid__Reco.
2875 0.003 recob::Vertexs_pmtrack__Reco.
2822 0.003 recob::Clusterrecob::Hitvoidart::Assns_blurredcluster__Reco.
2804 0.003 recob::PCAxis_pandoraShower__Reco.
2738 0.003 recob::Clusterrecob::Hitvoidart::Assns_pandora__Reco.
2692 0.003 recob::Clusterrecob::Hitvoidart::Assns_trajcluster__Reco.
2689 0.003 recob::Clusterrecob::Hitvoidart::Assns_linecluster__Reco.
2687 0.003 anab::ParticleIDs_pmtraffitcpid__Reco.
2683 0.003 recob::SpacePointrecob::Trackvoidart::Assns_pmtraffit__Reco.
2664 0.003 anab::ParticleIDs_pmtracktcpid__Reco.

And a few others, with many associations