ICEBERG Geometry V2

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ICEBERG AI/ML Meeting

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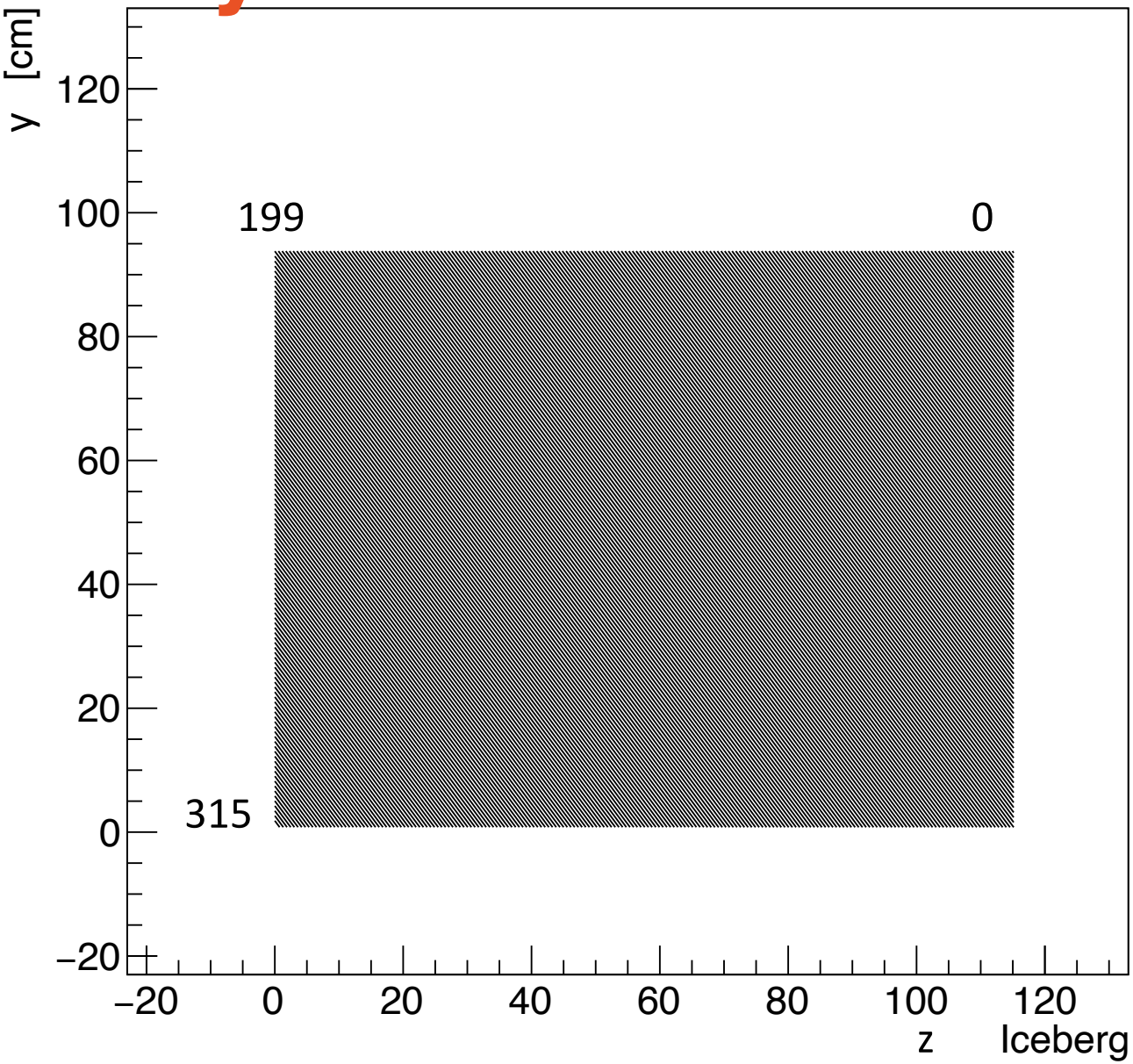
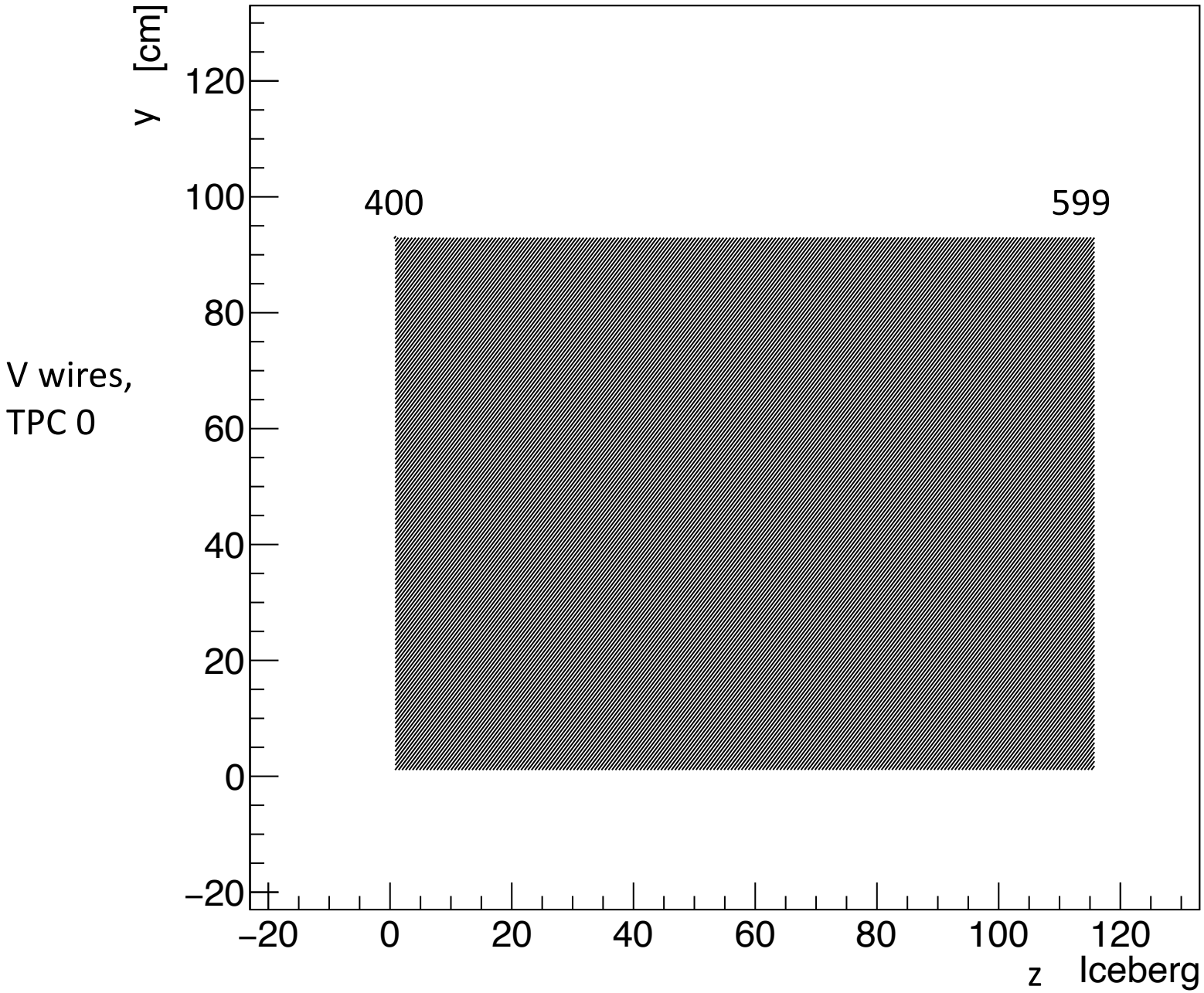
Fermilab DUNE

New Geometry

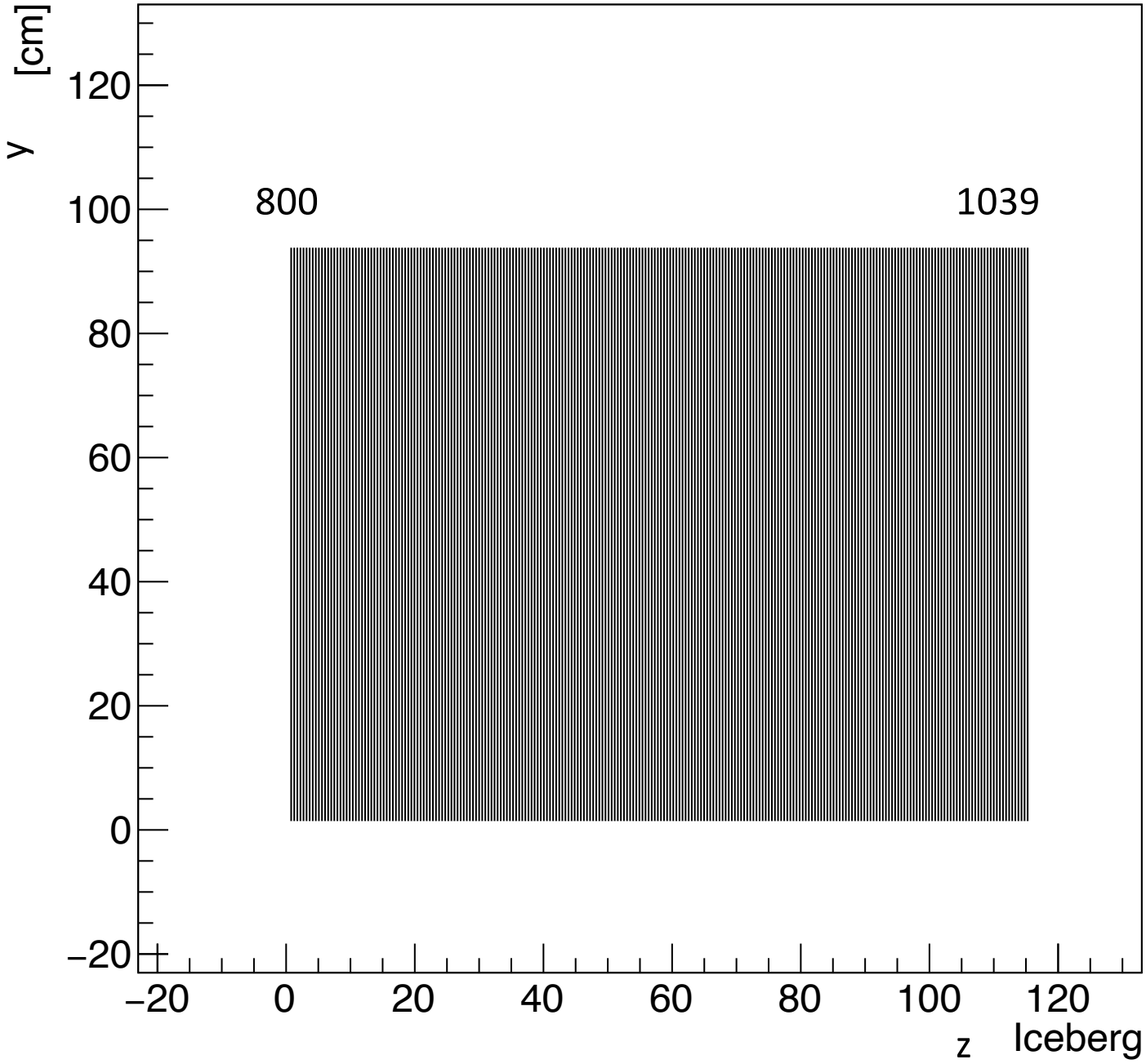
TPC 0, U




y [cm]
120
100
80
60
40
20
0
−20
400
599
V wires,
TPC 0
−20
0
20
40
60
80
100
120
z Iceberg

x wires,
TPC 0

Also: max
drift is now
30 cm per TPC
(U to cathode)

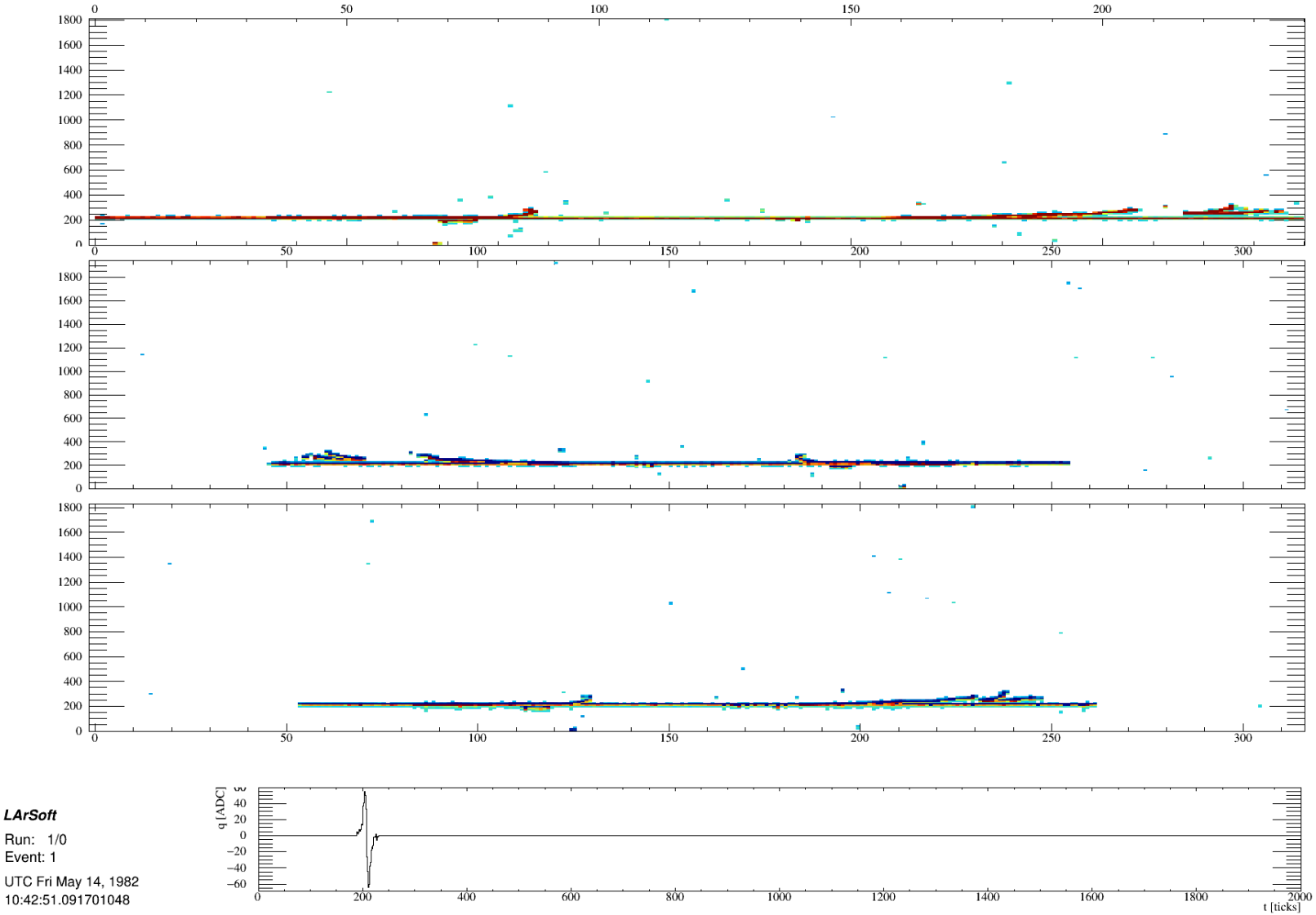


Changes to the sorting code

- 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.



Simulation + Reconstruction

- New geometry should have no effect on decoding raw digits
- Fewer ghost reco tracks due to fewer crossings of wires (only real crossings now)
- I'm not sure if PANDORA needs an update – possibly not, but it does have an awareness of the geometry
- WireCell also ought to work the same
- Only standard noise models in the MC. Perhaps data overlay makes more sense as noise is variable and has interesting structures in the data.