

Online LAr Purity Monitoring in DUNE 35t prototype

Trying to generate CRY cosmic ray samples

- More realistic spectrum of muons (energy, momentum, position)
- Estimate live time needed to get purity measure

Been working with Dominic Brailsford on filtering CRY output to reduce time taken

- Taking longer than expected (my time + simulation time)

Finally have CRY samples:

- 6.2 million CRY events -> 30,000 surviving events (pass filters)

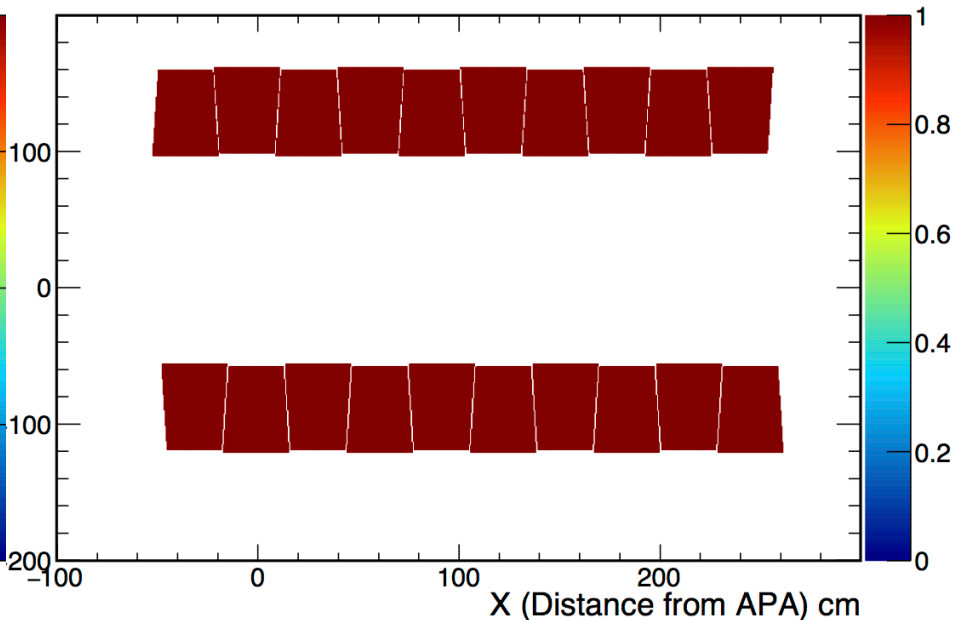
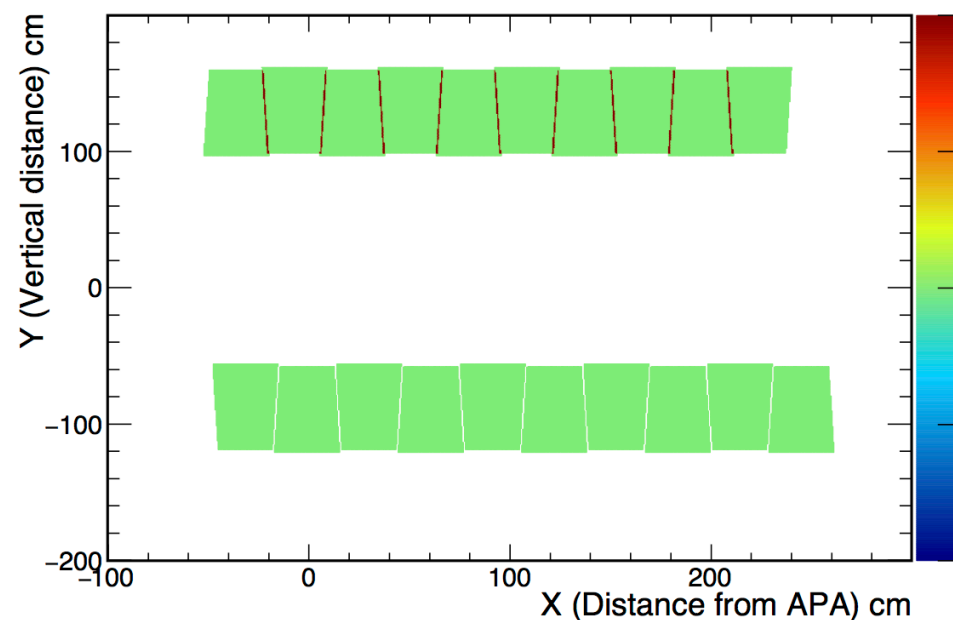
Thanks to Tyler, v5 geometry corrects overlapping counter bug

v4 Geometry

v5 Geometry

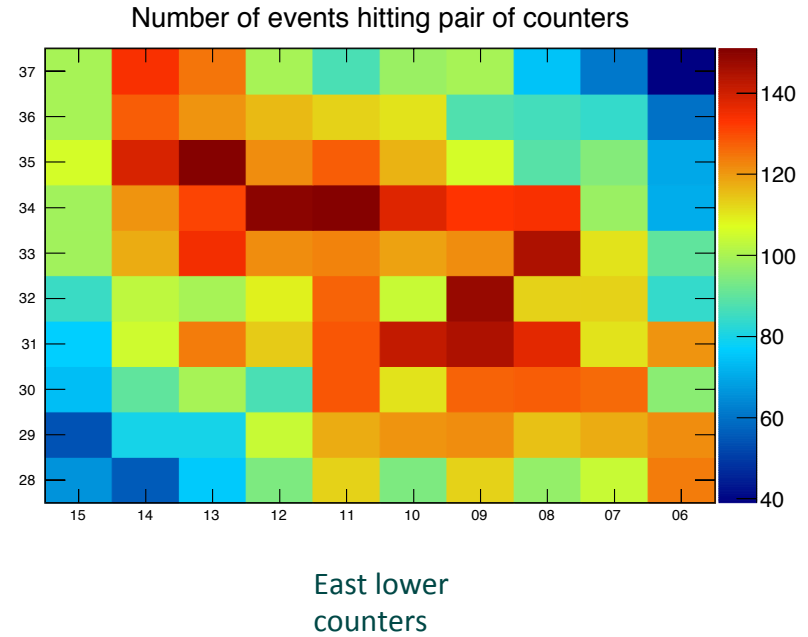
External Counter Projection on XY plane

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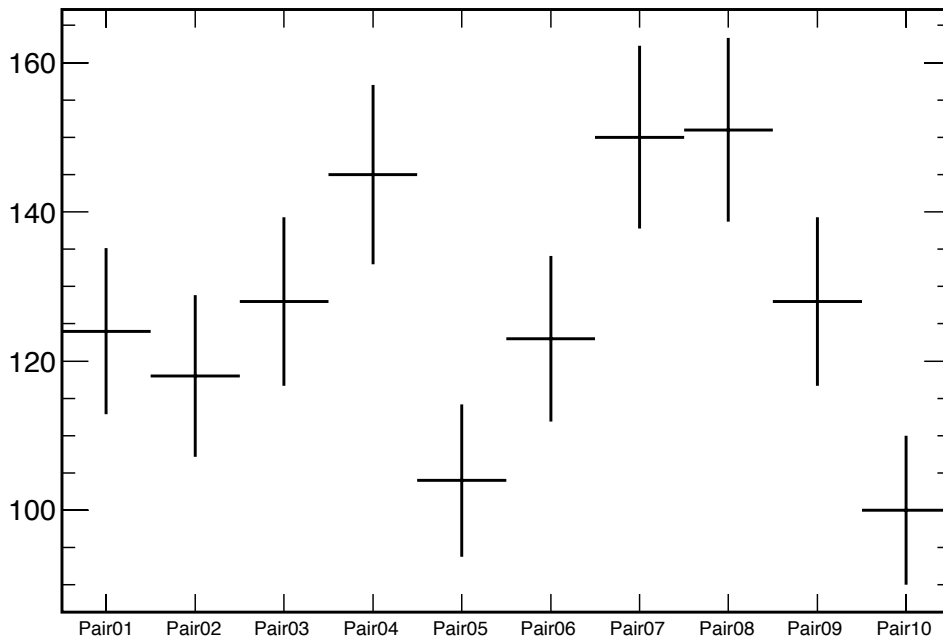


All data simulated with v04_16_00 lbncode + v5 of geometry

Right: Histogram events with hits in pairs of counters (counter index on x and y axes)

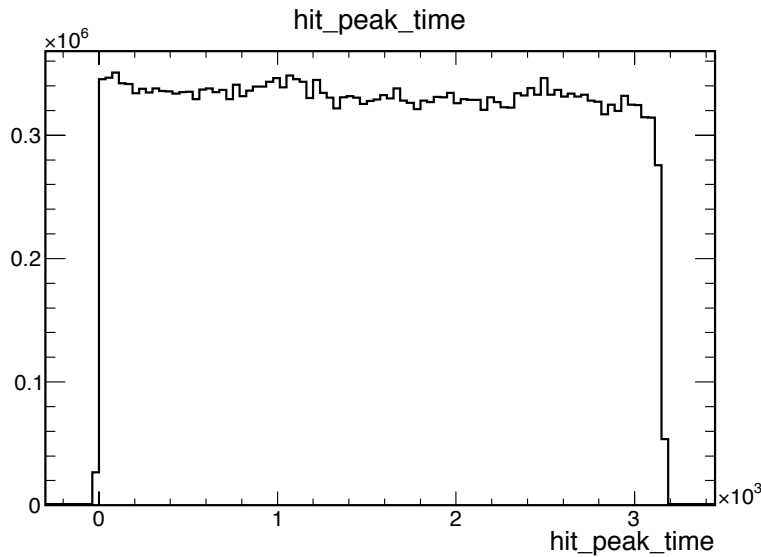


Number of events hitting counter pair

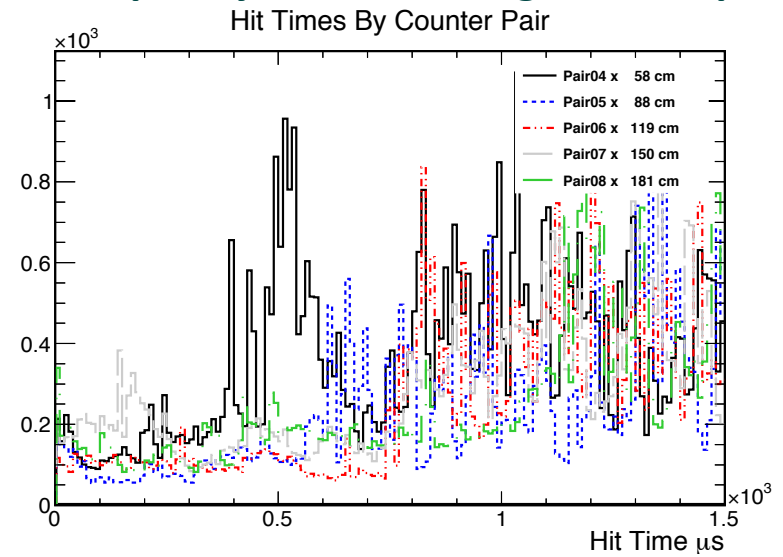


Left: Opposing counters form pairs (Pair 1 == counter 15 && counter 28)

Hit time – all hits in all events

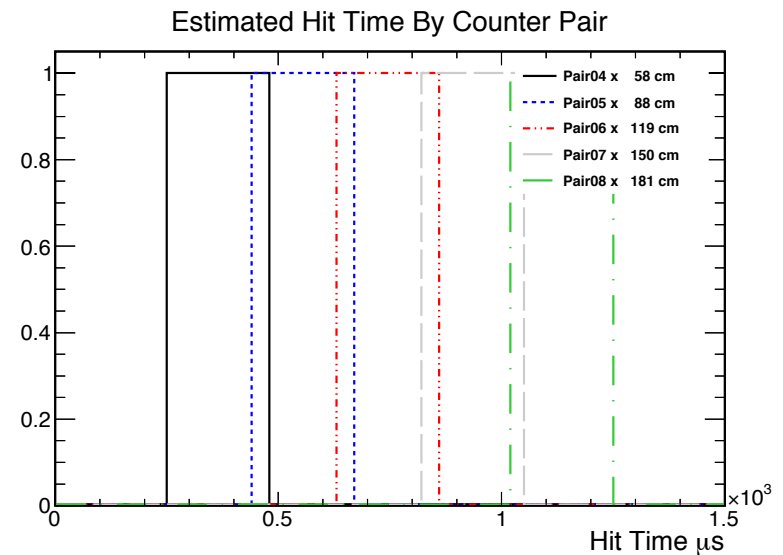


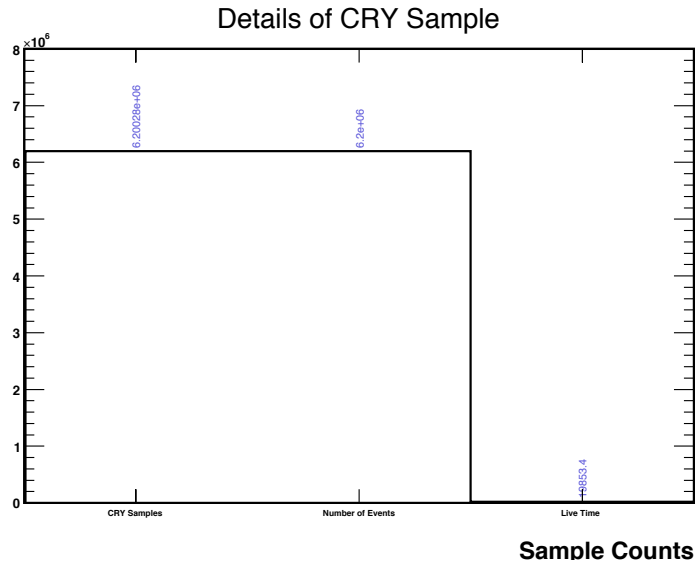
Hit time – split by events hitting counter pairs



Right: is the estimated range of times expected from muons hitting particular pairs of counters

Don't see excess around expected time...





A small aside – Added so monitoring into the CRY generation stage.

Looks like # of CRY samples thrown is pretty much the same as the # of events

Muon angles seems to be as expected

