

From simulation: dependence on 3- γ position: drift direction - x

Left plot: larger PD signal when source is closer to XA (expected)

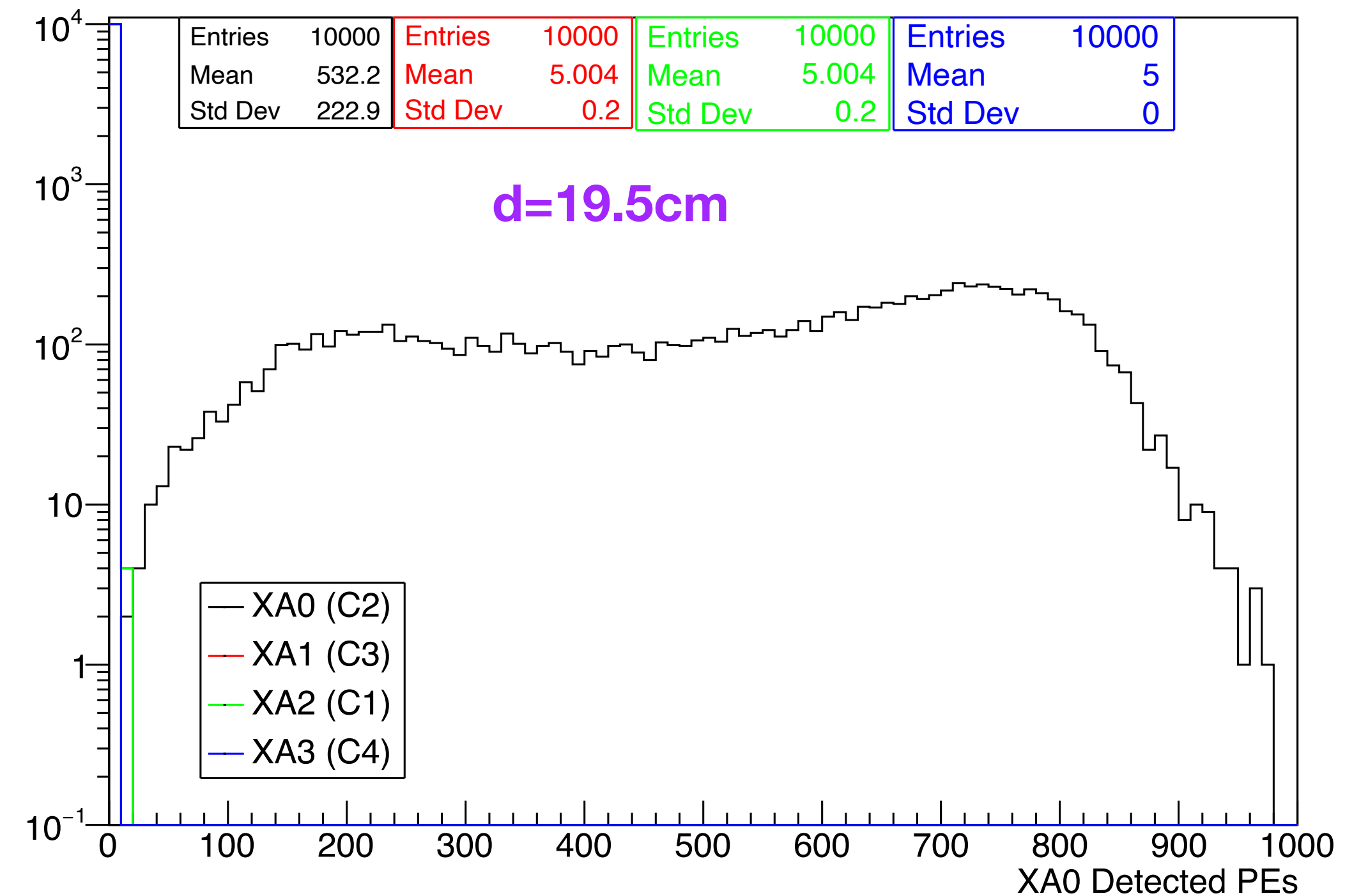
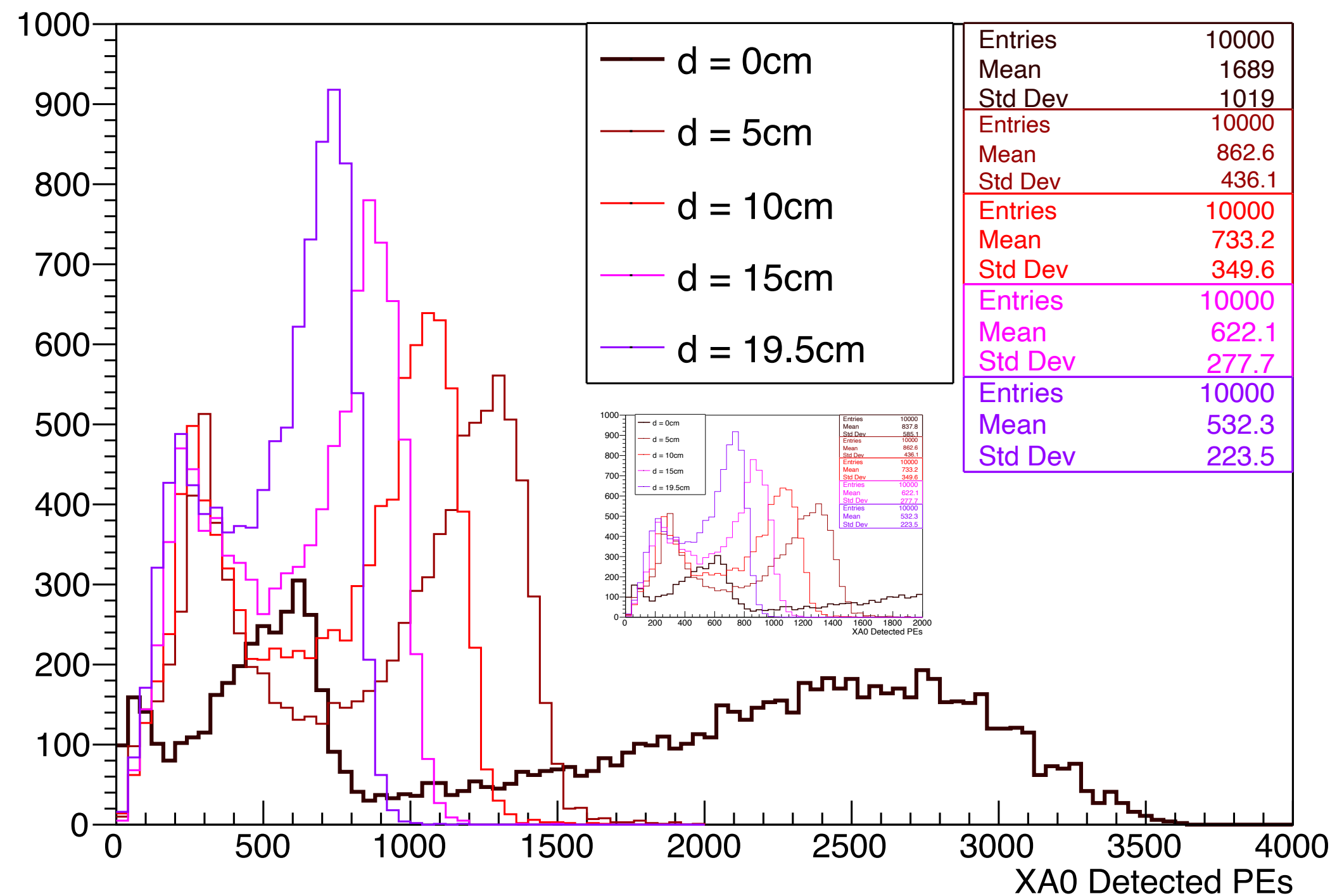
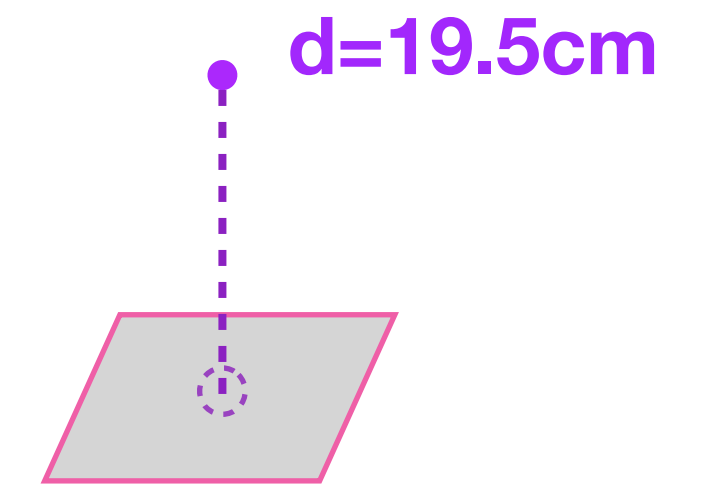
Double peak structure well-preserved

Resolution improves @ larger drift distance (expect better E res in PD-VD / FD)

Right plot: one conservative cut can be: XA0 > 500 PE, XA1,2,3 < 10 PE

This data selection rule doesn't depend on CRP

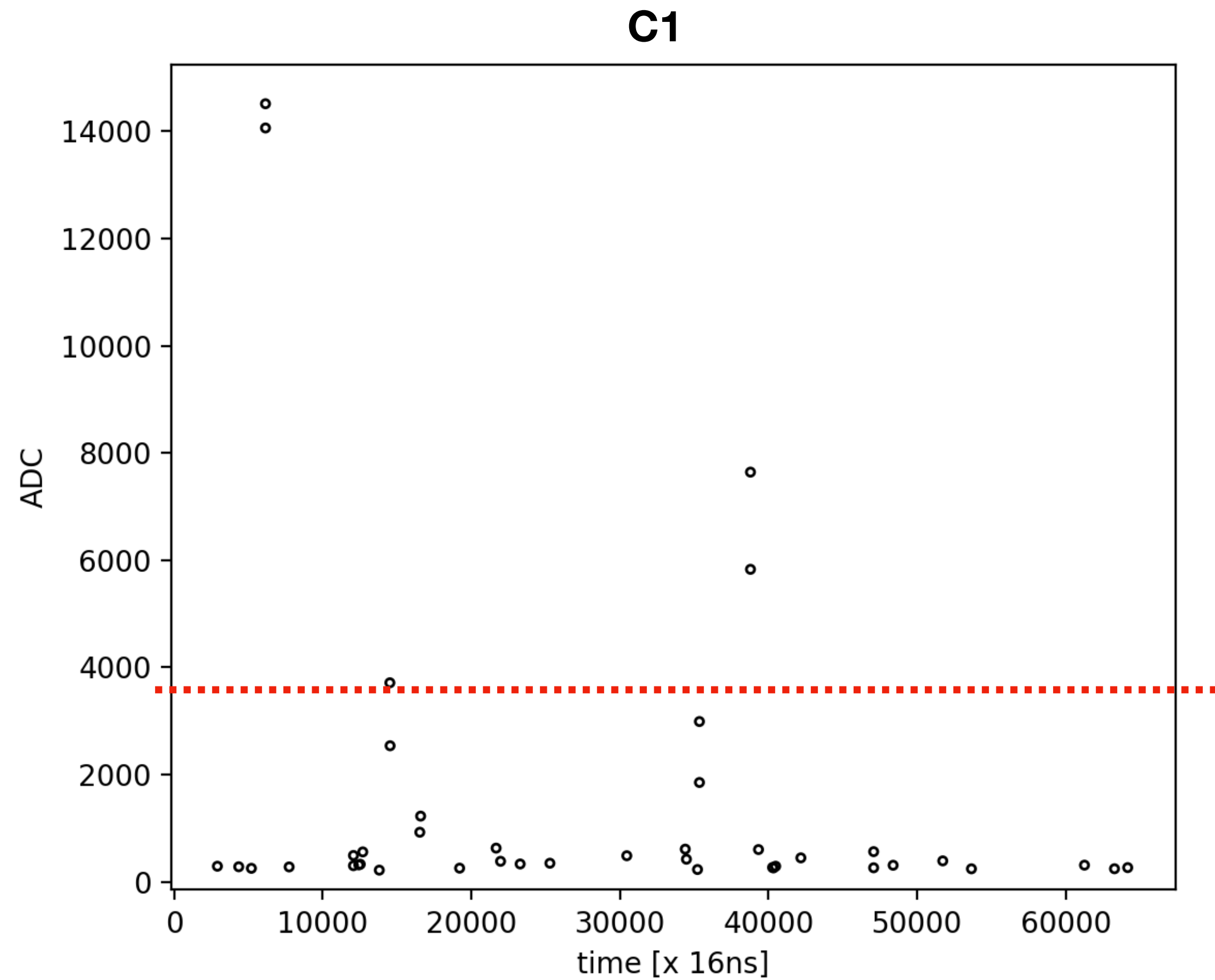
But to derive position-wise LY map, we need CRP position information



Lardon: Single Event PD Peaks Example

**Eyeball most events are like this:
Only 1-2 peaks above 3500 ADC/channel (where most useful PNS signals are expected)**

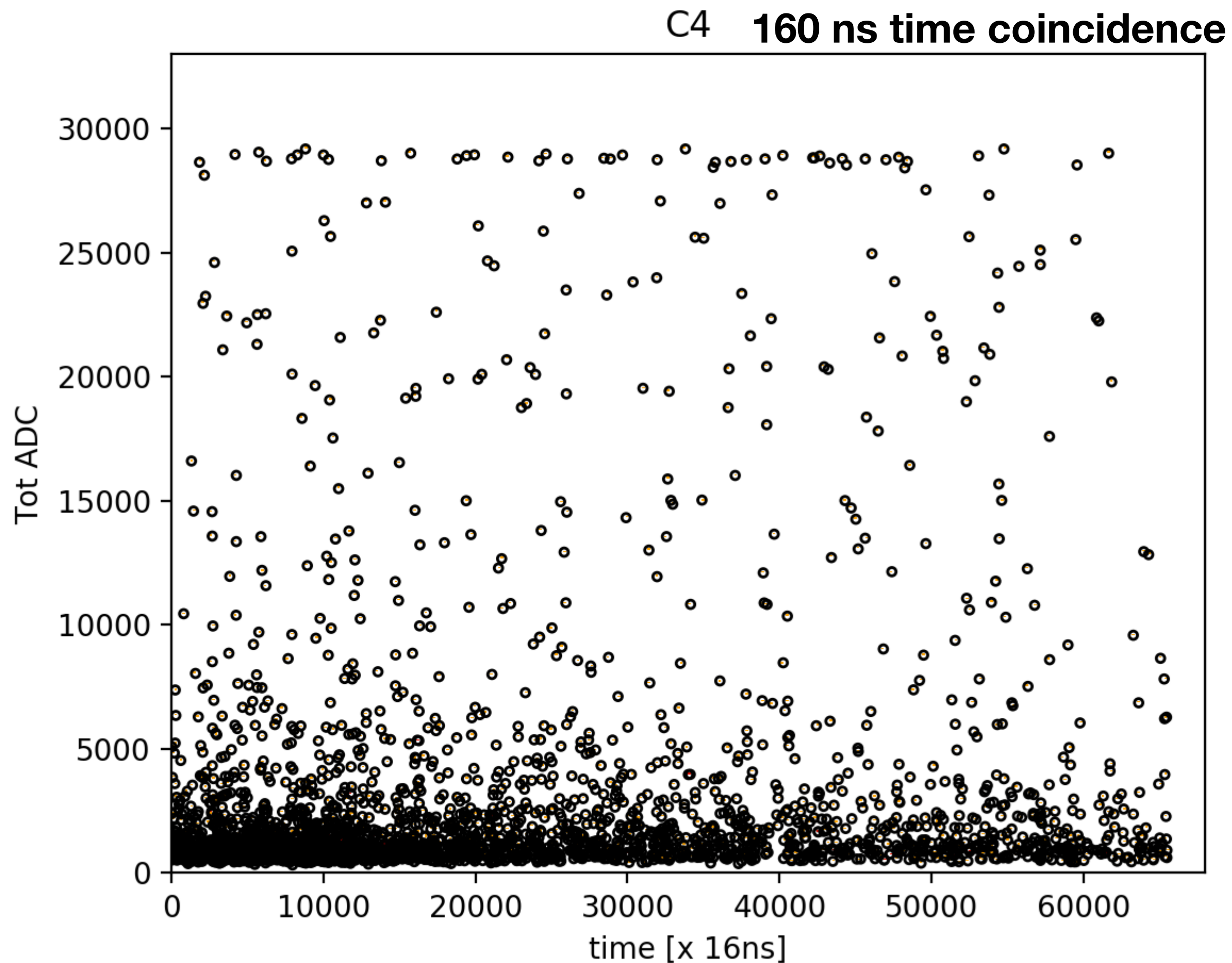
PNS Run 25068 - Apr18



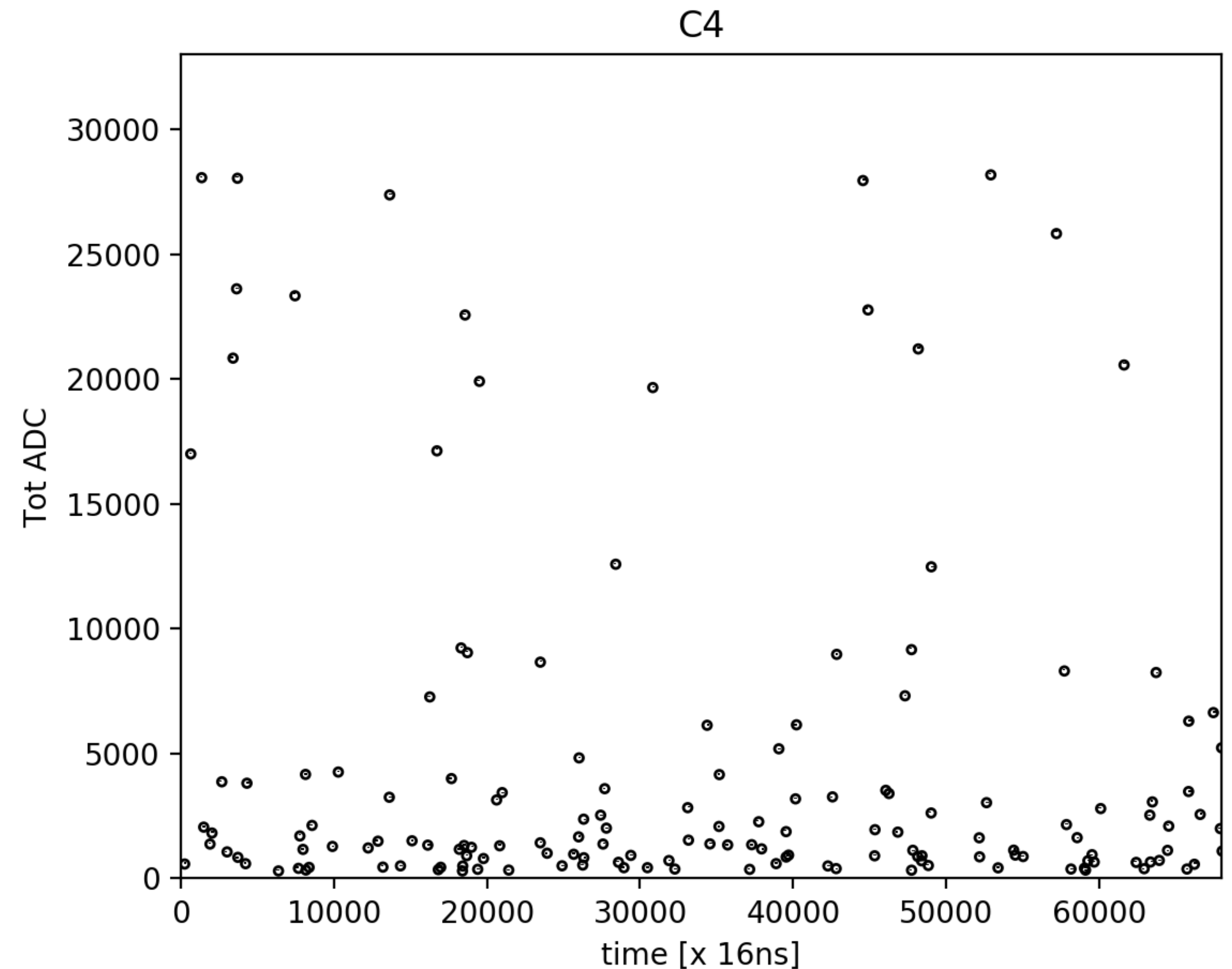
C4 peak total ADC - time

First idea is to look at PD peaks “total ADC - time”, to see if we can easily observe separation of “PNS” vs “no PNS”
We can see obvious increased activity per PD module, but no clear separation line

PNS Run 25068 - Apr18 (~50k events)



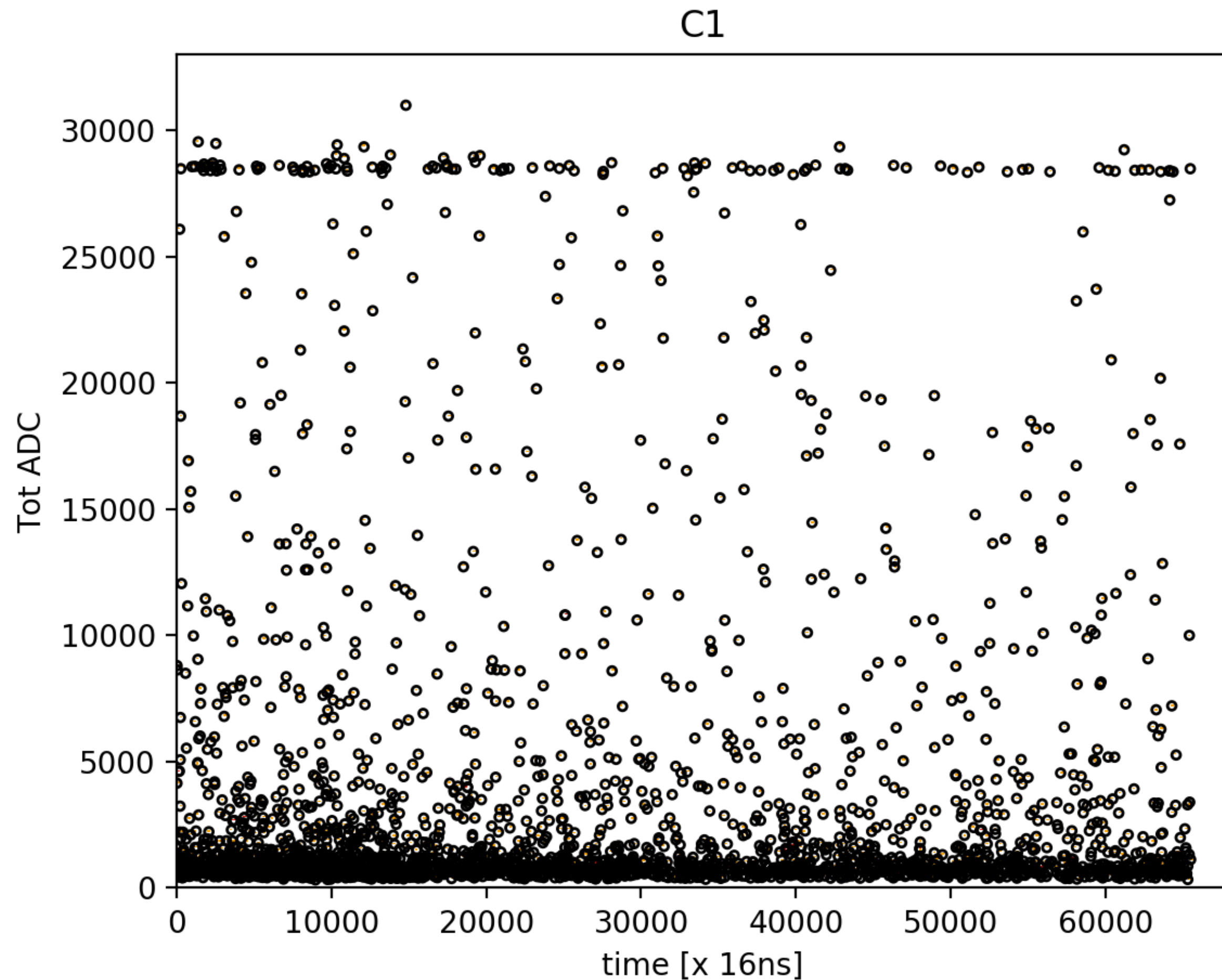
Cosmic Run 25078 - Apr18 - (~50k events)
Only plotted up to ~1ms (trigger window is 4ms long)



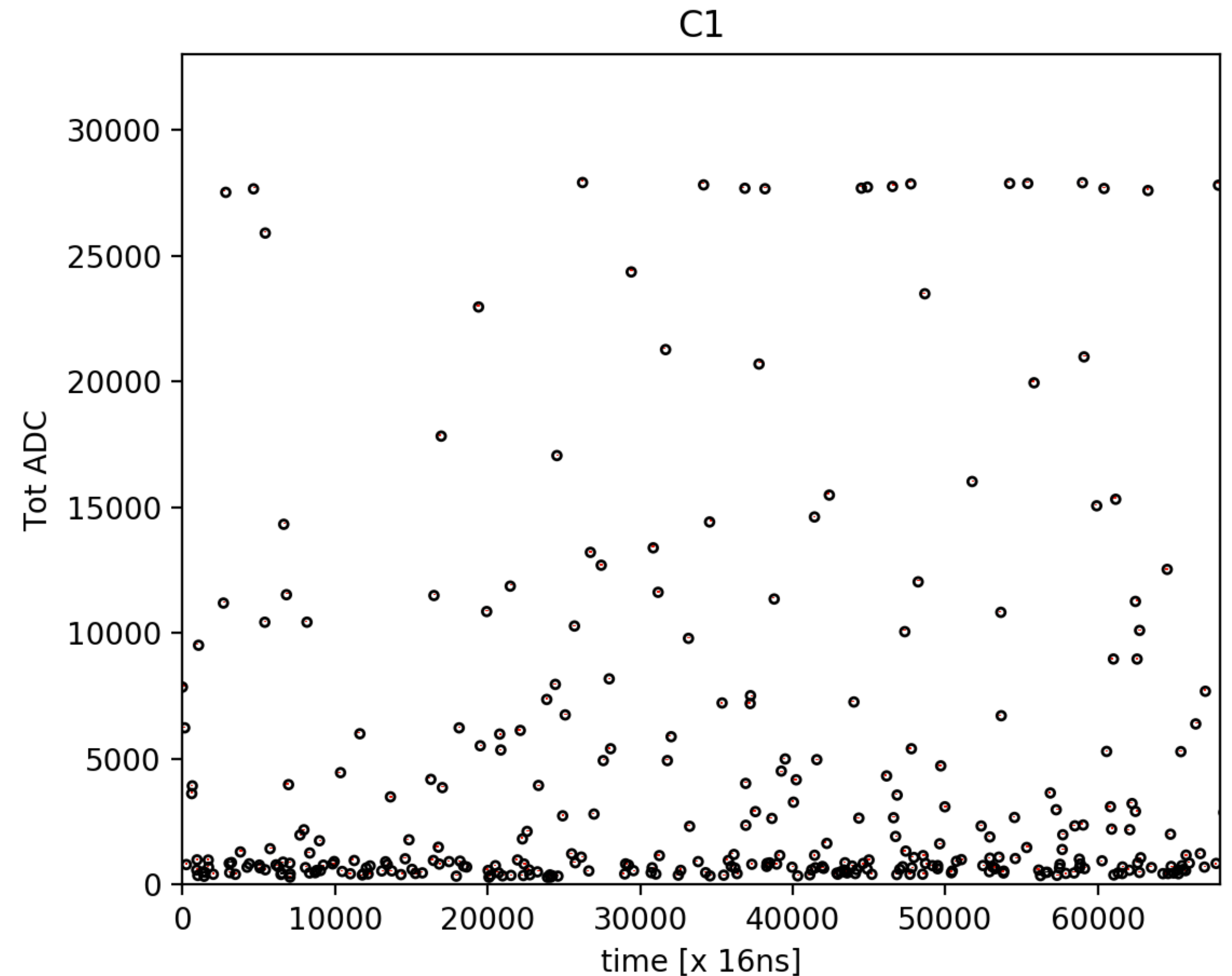
C1 peak total ADC - time

First idea is to look at PD peaks “total ADC - time”, to see if we can easily observe separation of “PNS” vs “no PNS”
We can see obvious increased activity per PD module, but no clear separation line

PNS Run 25068 - Apr18 (~50k events)



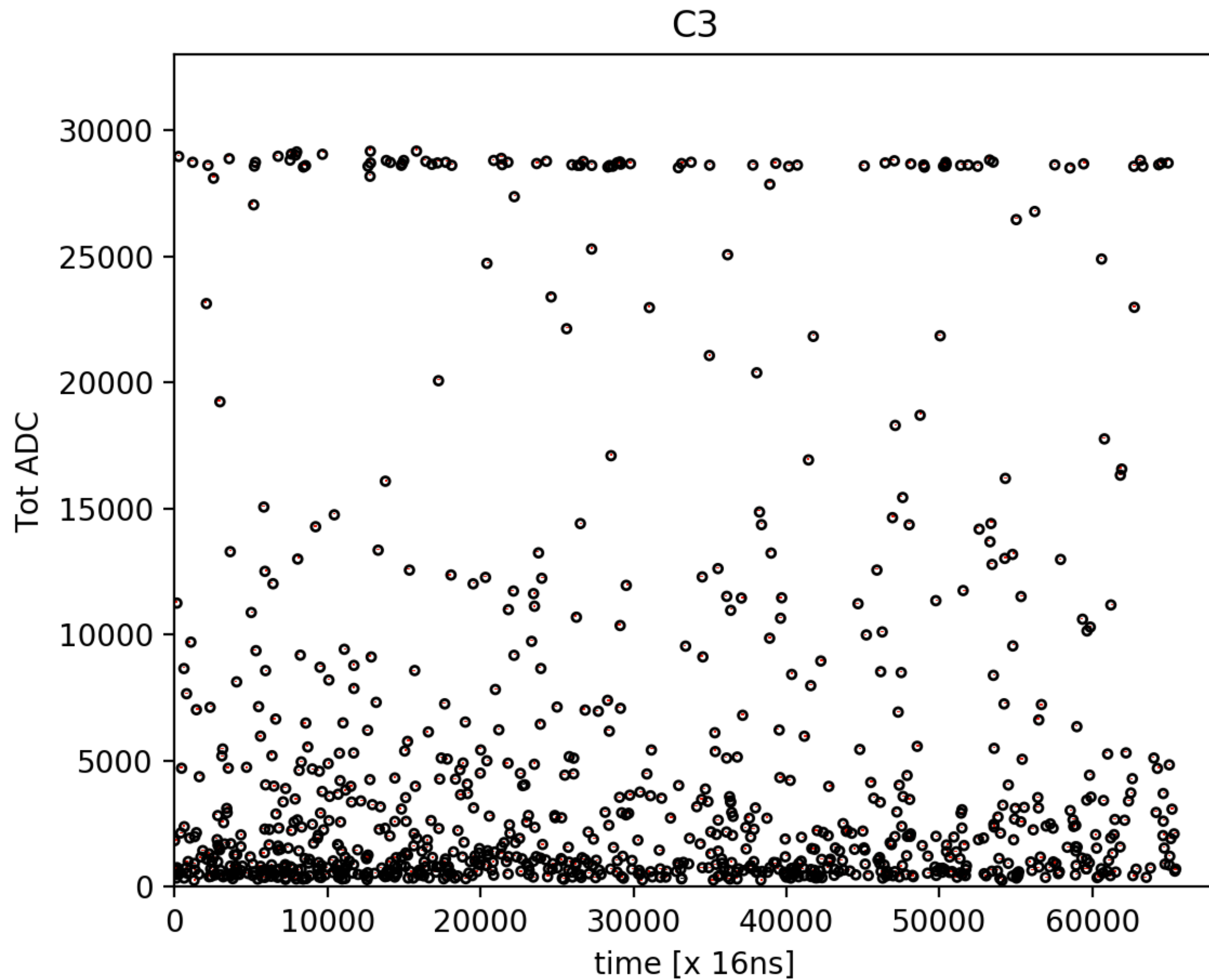
Cosmic Run 25078 - Apr18 - (~50k events)



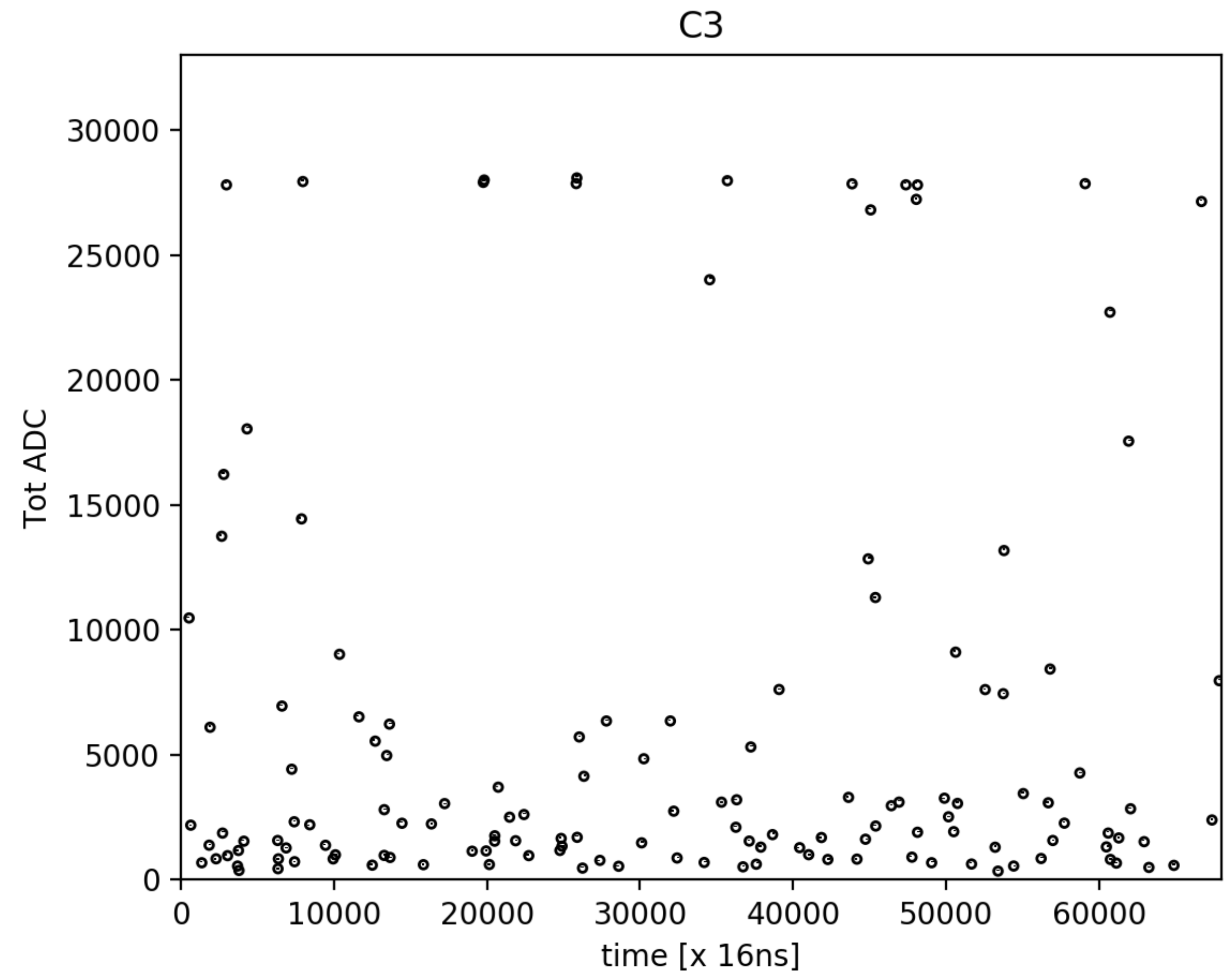
C3 peak total ADC - time

First idea is to look at PD peaks “total ADC - time”, to see if we can easily observe separation of “PNS” vs “no PNS”
We can see obvious increased activity per PD module, but no clear separation line

PNS Run 25068 - Apr18 (~50k events)



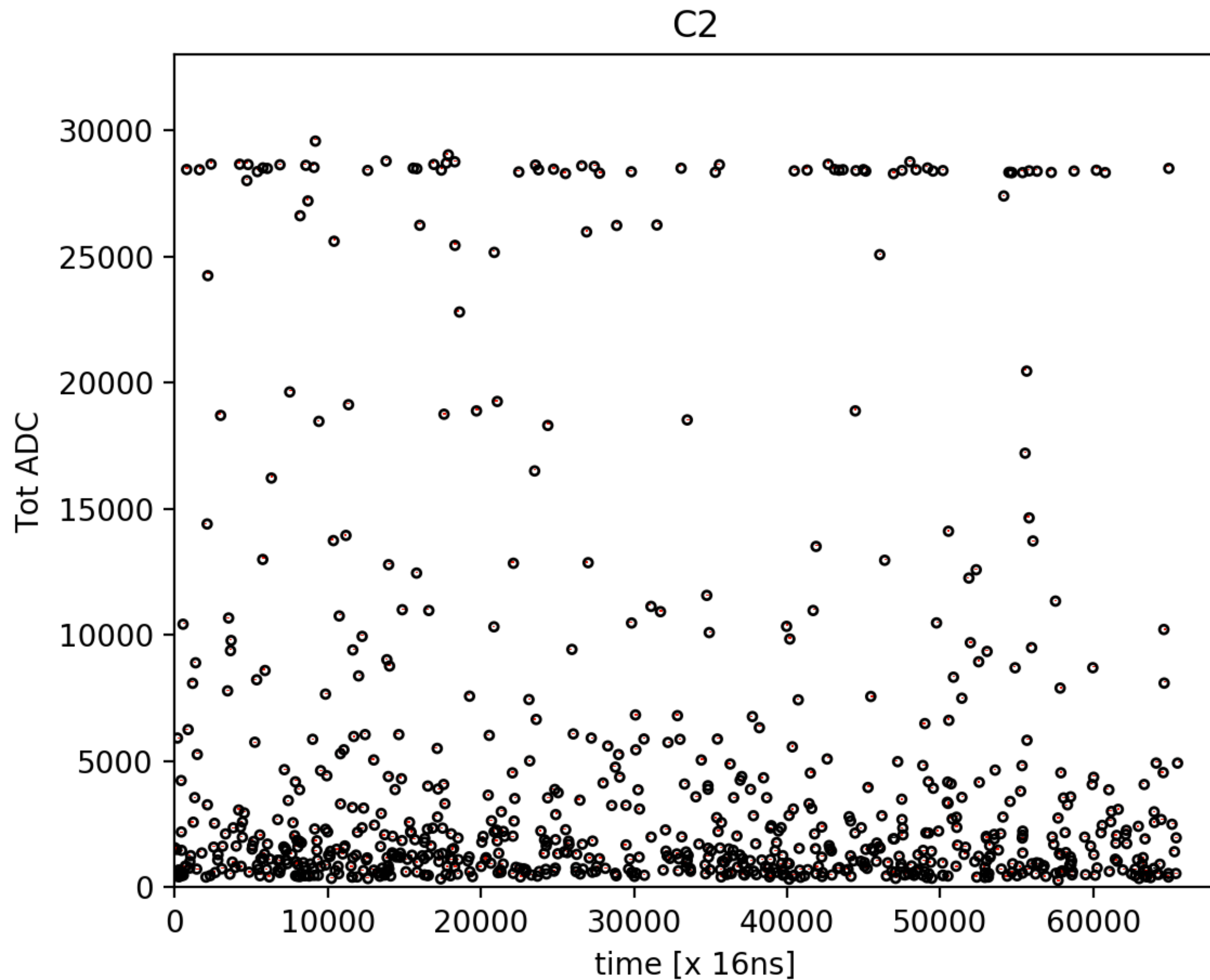
Cosmic Run 25078 - Apr18 - (~50k events)



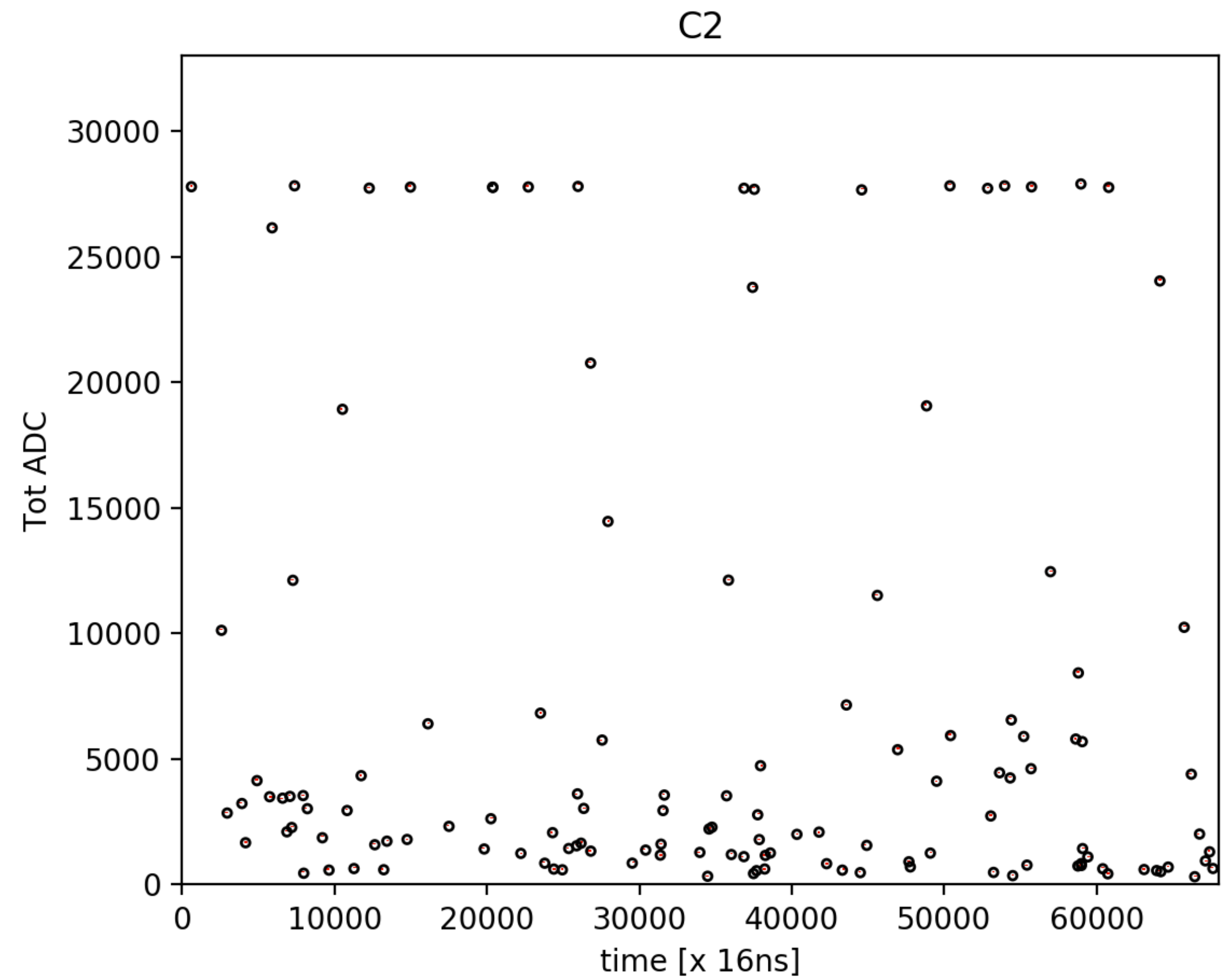
C2 peak total ADC - time

First idea is to look at PD peaks “total ADC - time”, to see if we can easily observe separation of “PNS” vs “no PNS”
We can see obvious increased activity per PD module, but no clear separation line

PNS Run 25068 - Apr18 (~50k events)

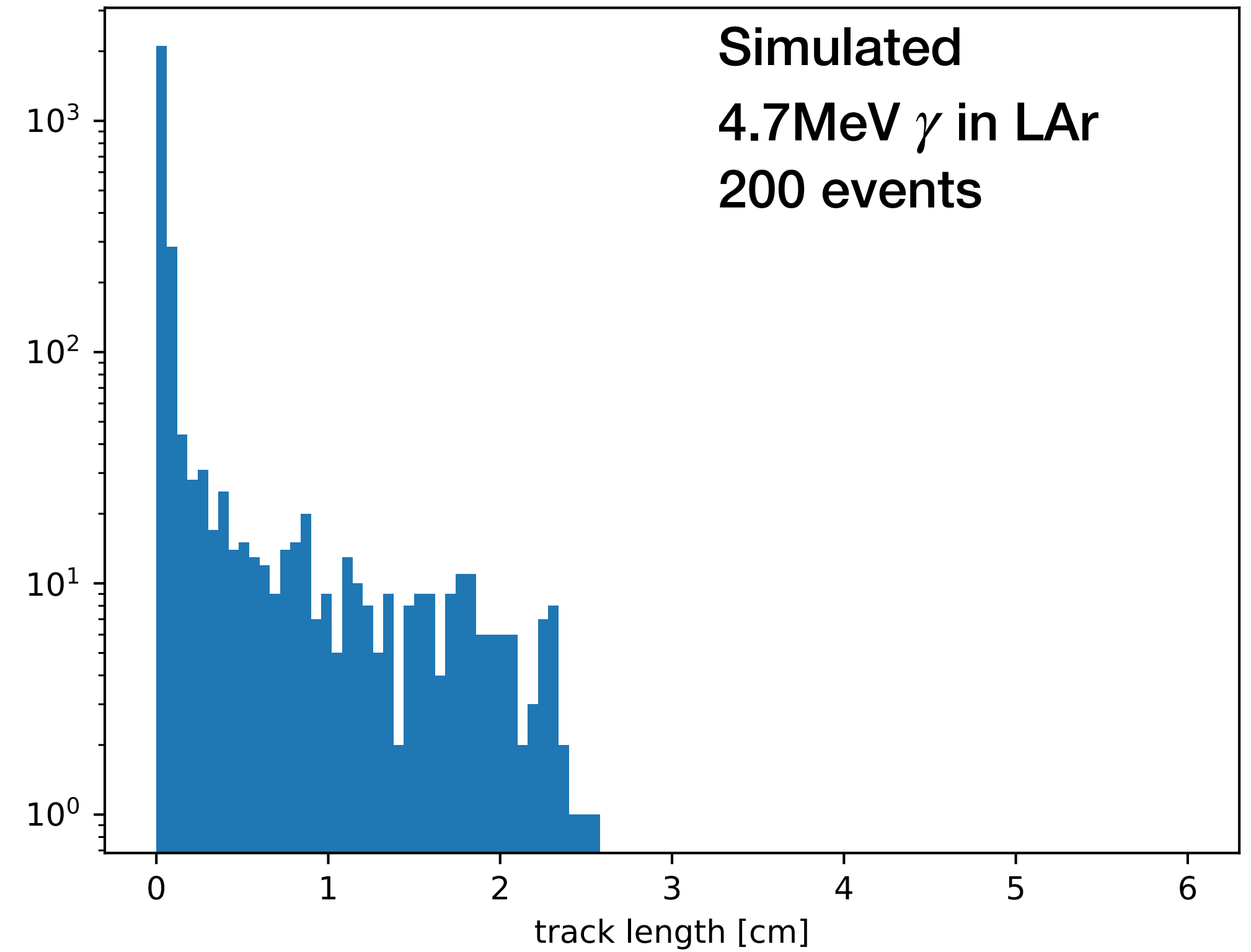
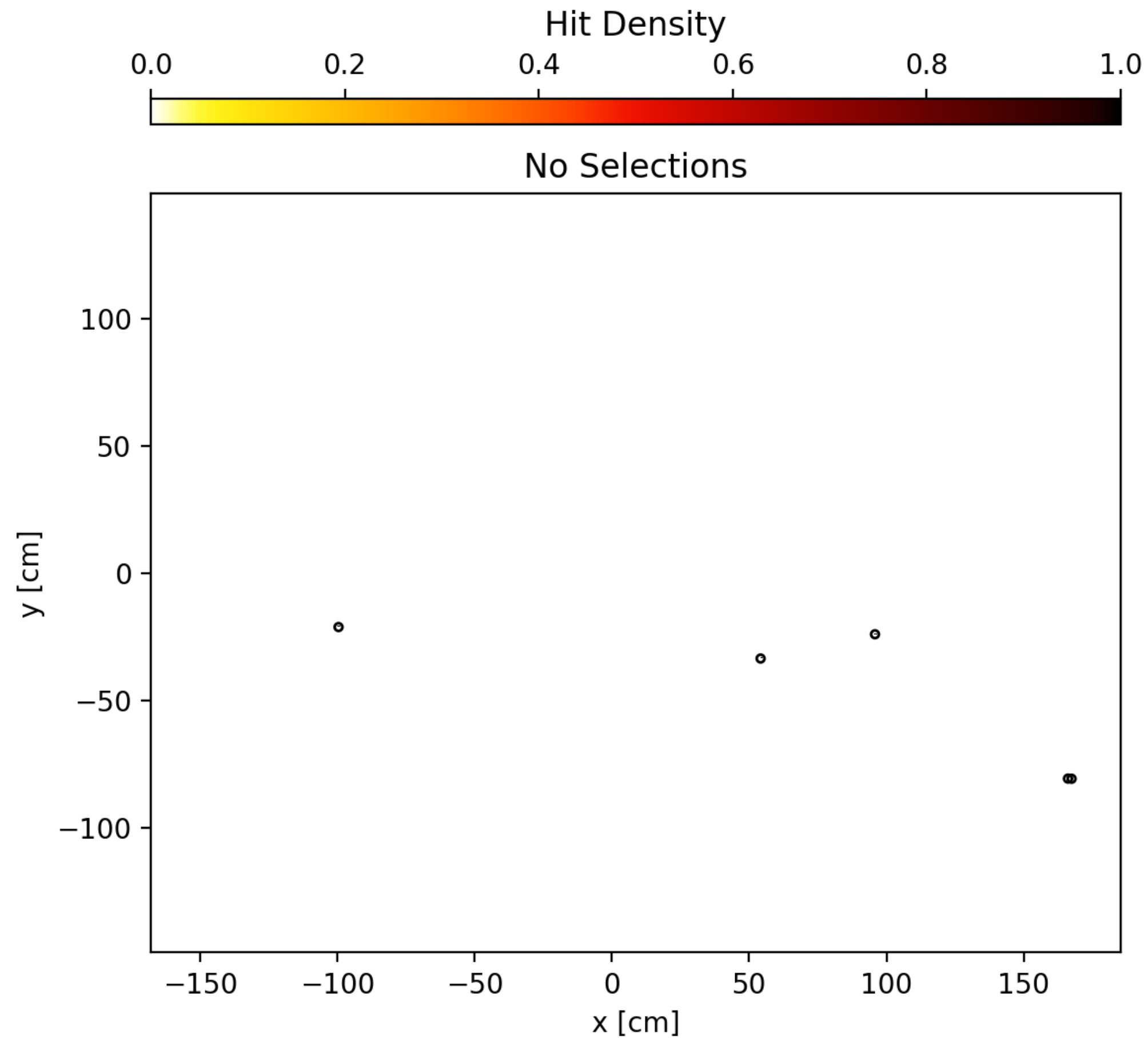


Cosmic Run 25078 - Apr18 - (~50k events)



CRP Data - Event level Single Hits (tracks not plotted)

Hits not associated with 2D/3D/ghost track in default charge reconstruction
(Could be further tuned for PNS signal)



Analysis plans with Lardon framework

- Short term (1-2 weeks): will try match PD peaks signal to CRP hit info (time/position) to see if result is promising (i.e., can we see a gaussian peak in adc similar as simulation)
- In the longer term will switch to LArSoft