2x2 E-board/Ground Events

Roberto Mandujano
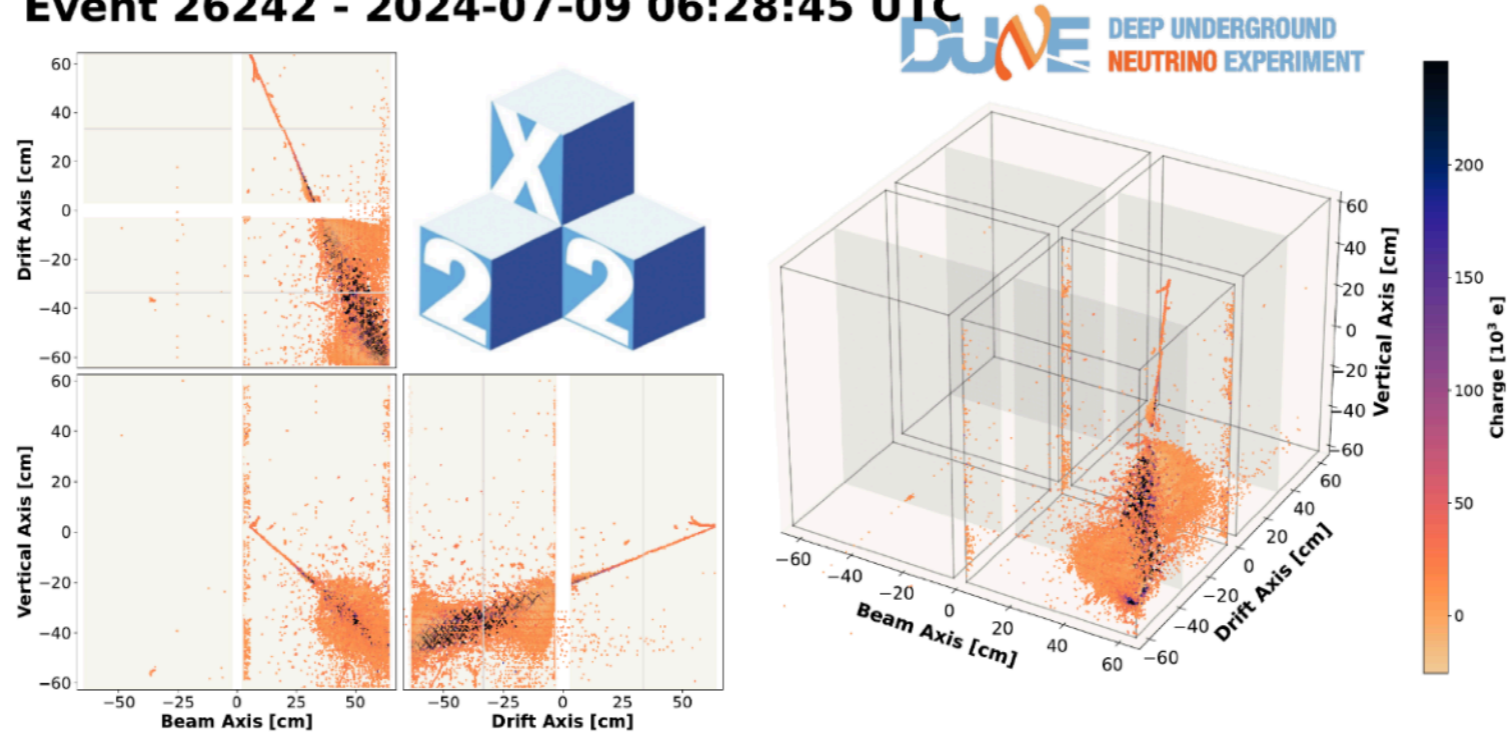
- It has been noted that activity in the light readout can trigger the charge readout through the former's electronics board (e-board)

- Final goal is to filter these types of events

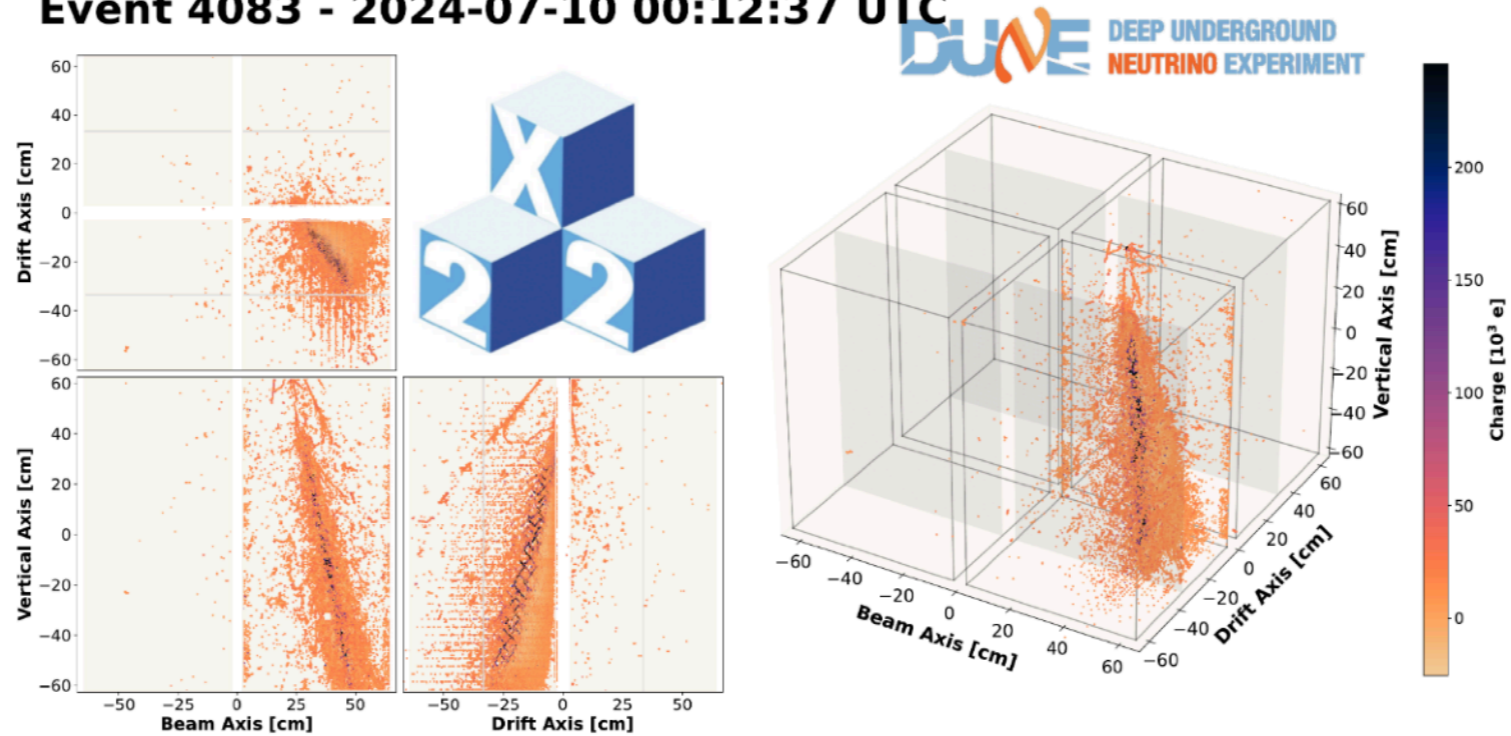- Using /global/cfs/cdirs/dune/www/data/2x2/nearline/flowed_charge/ REFLOW/v5/beam/ July 8 and July 10 nominal HV data

Event 26242 - 2024-07-09 06:28:45 UTC
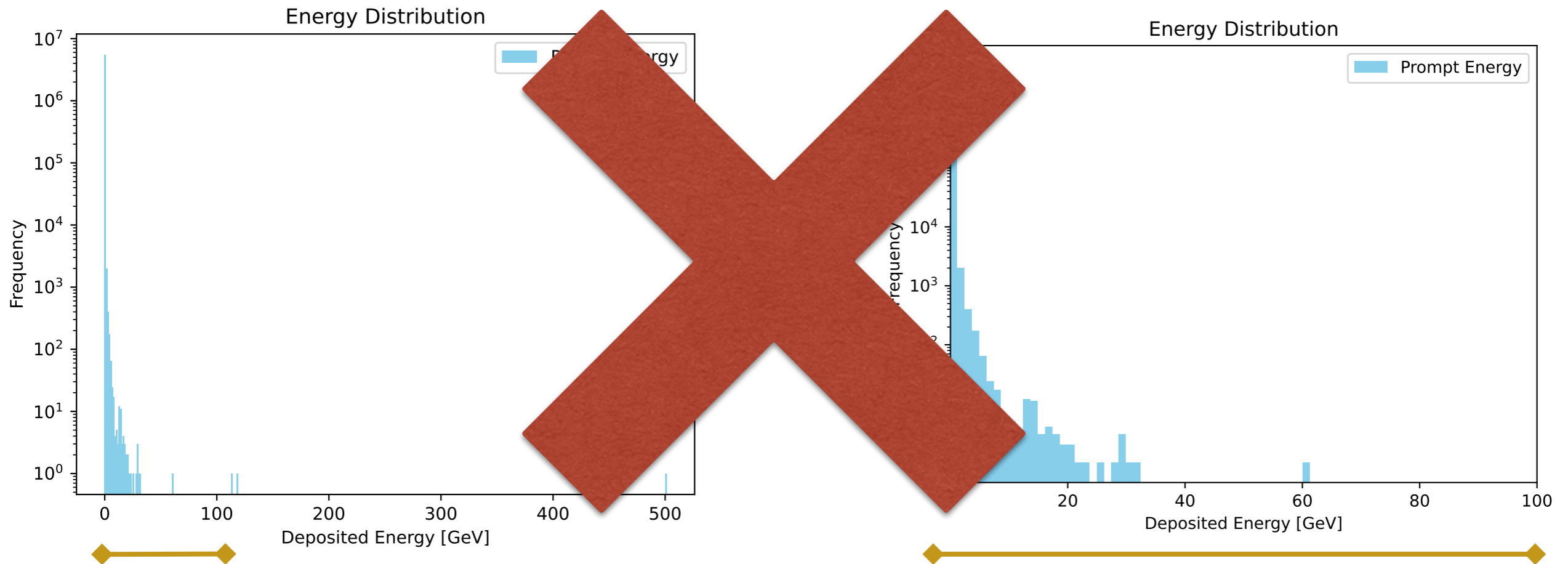

Event 4083 - 2024-07-10 00:12:37 UTC

- E-board trigger events tend to have very high energy
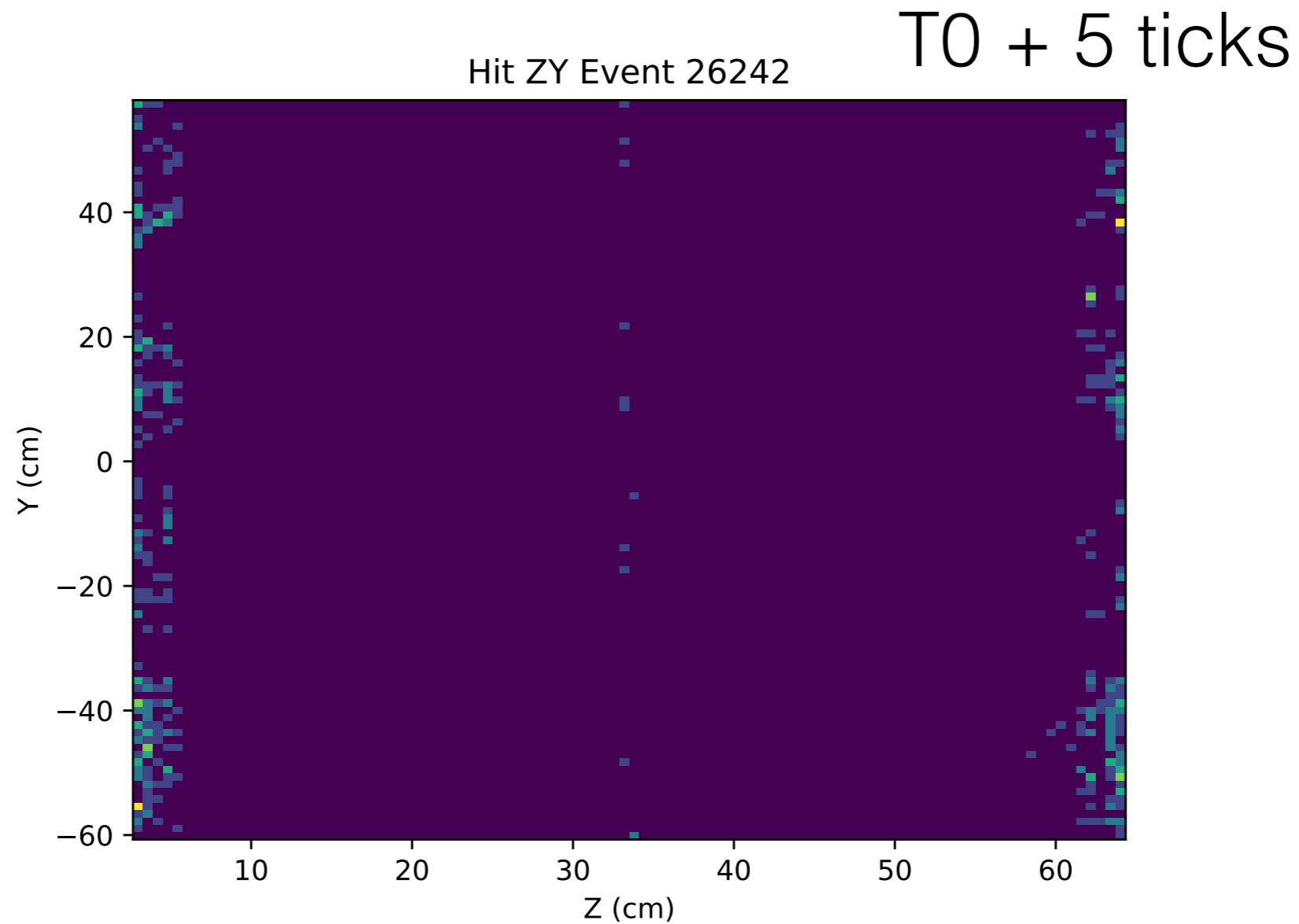
  - Select the sparse events over ~20 GeV

Hit ZY Event 26242

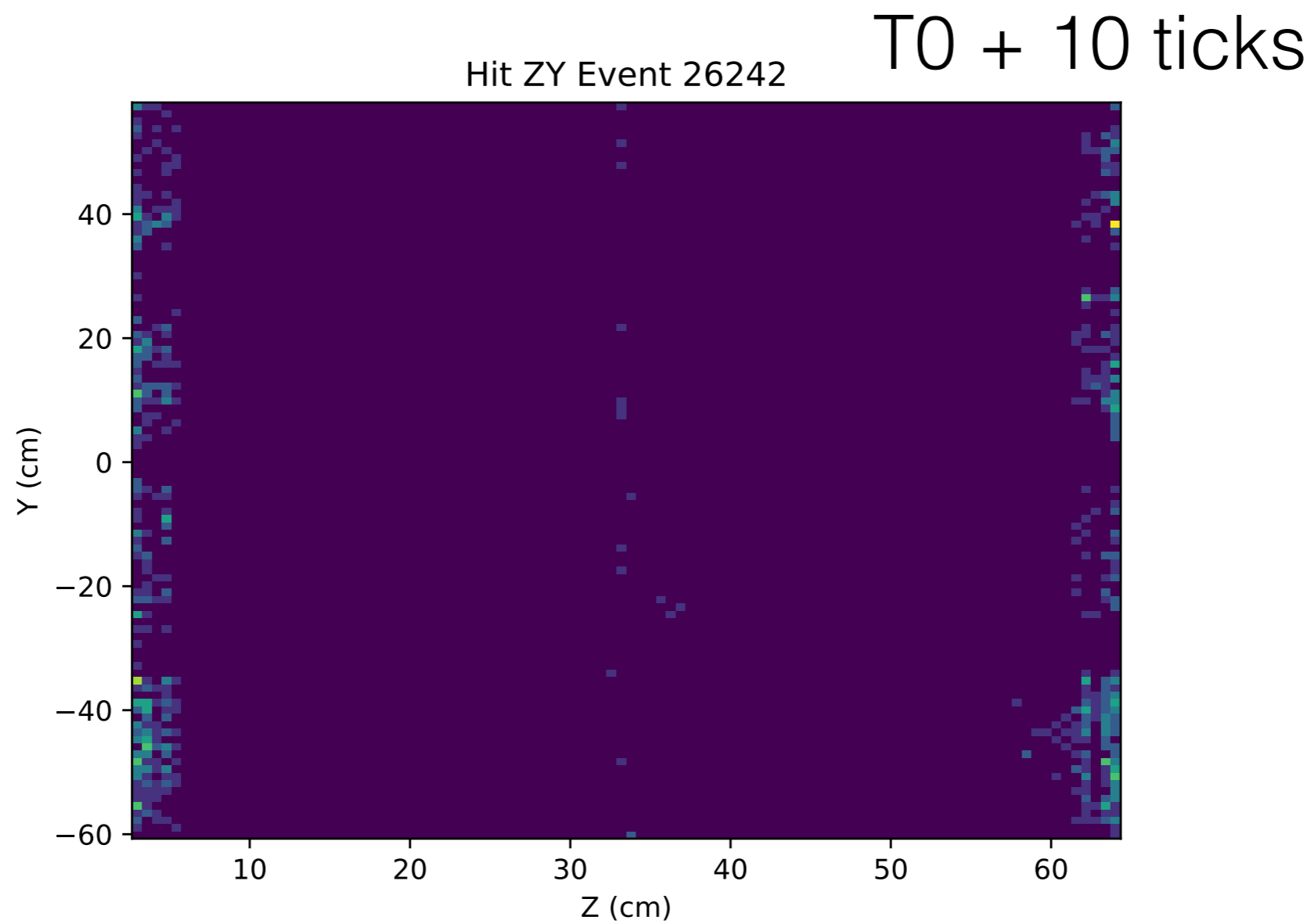T0 + 5 ticks

- Z,Y for hits 5 (100 nanosecond) ticks from the event start

- Starts with mostly line of charge only

T0 + 10 ticks

Hit ZY Event 26242

T0 + 20 ticks
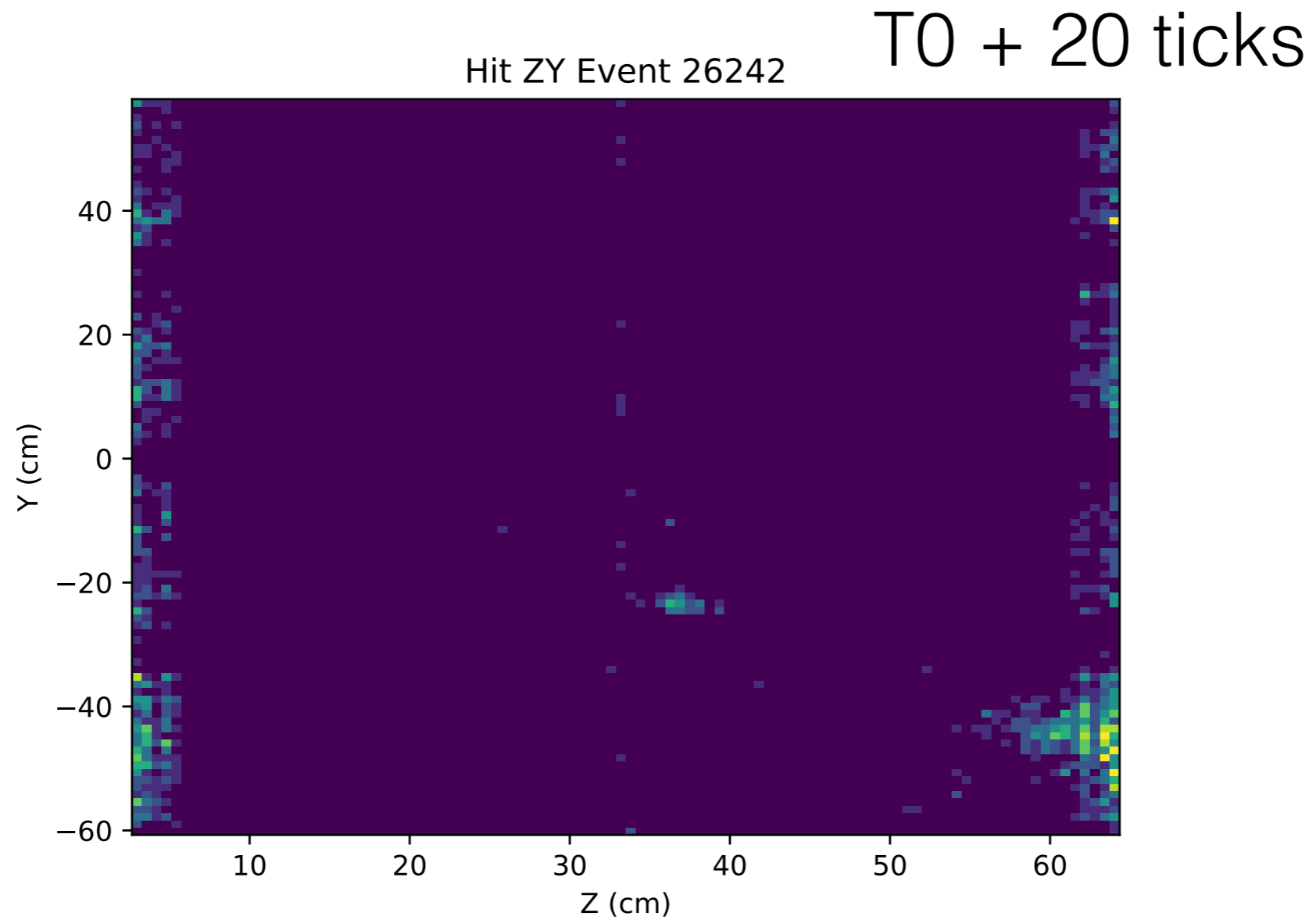
Hit ZY Event 26242
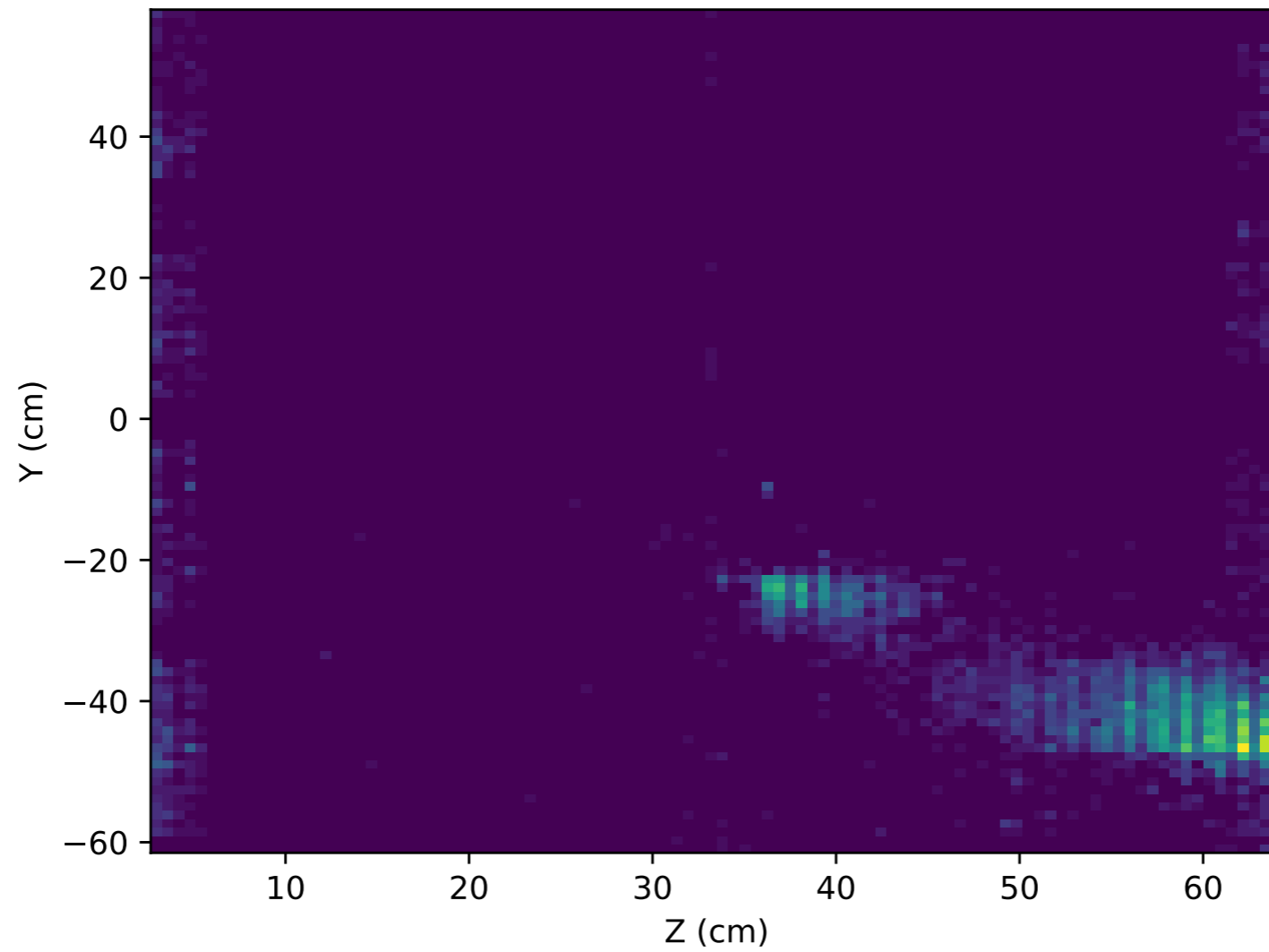
- Physics signal starts to appear
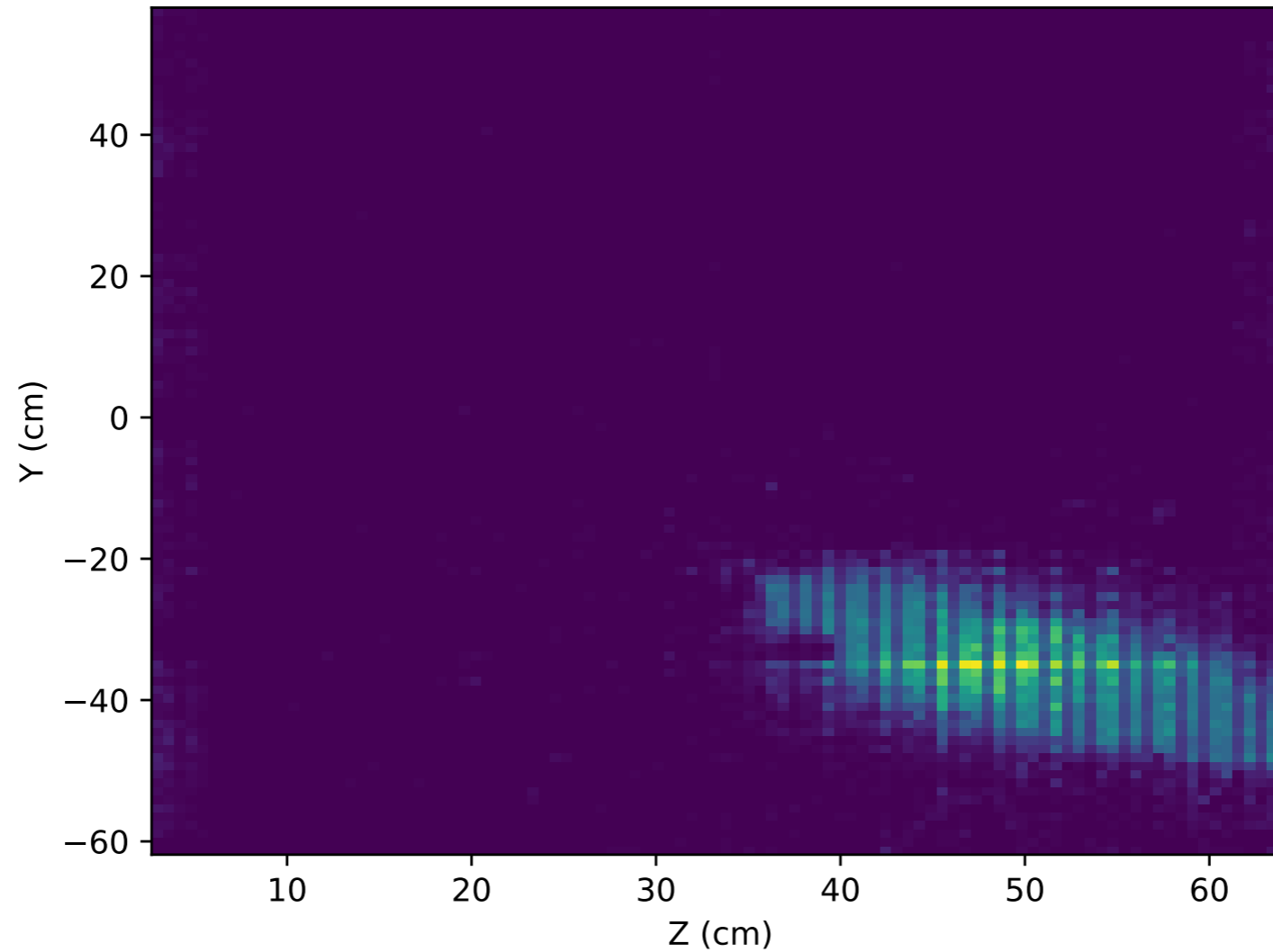
T0 + 50 ticks
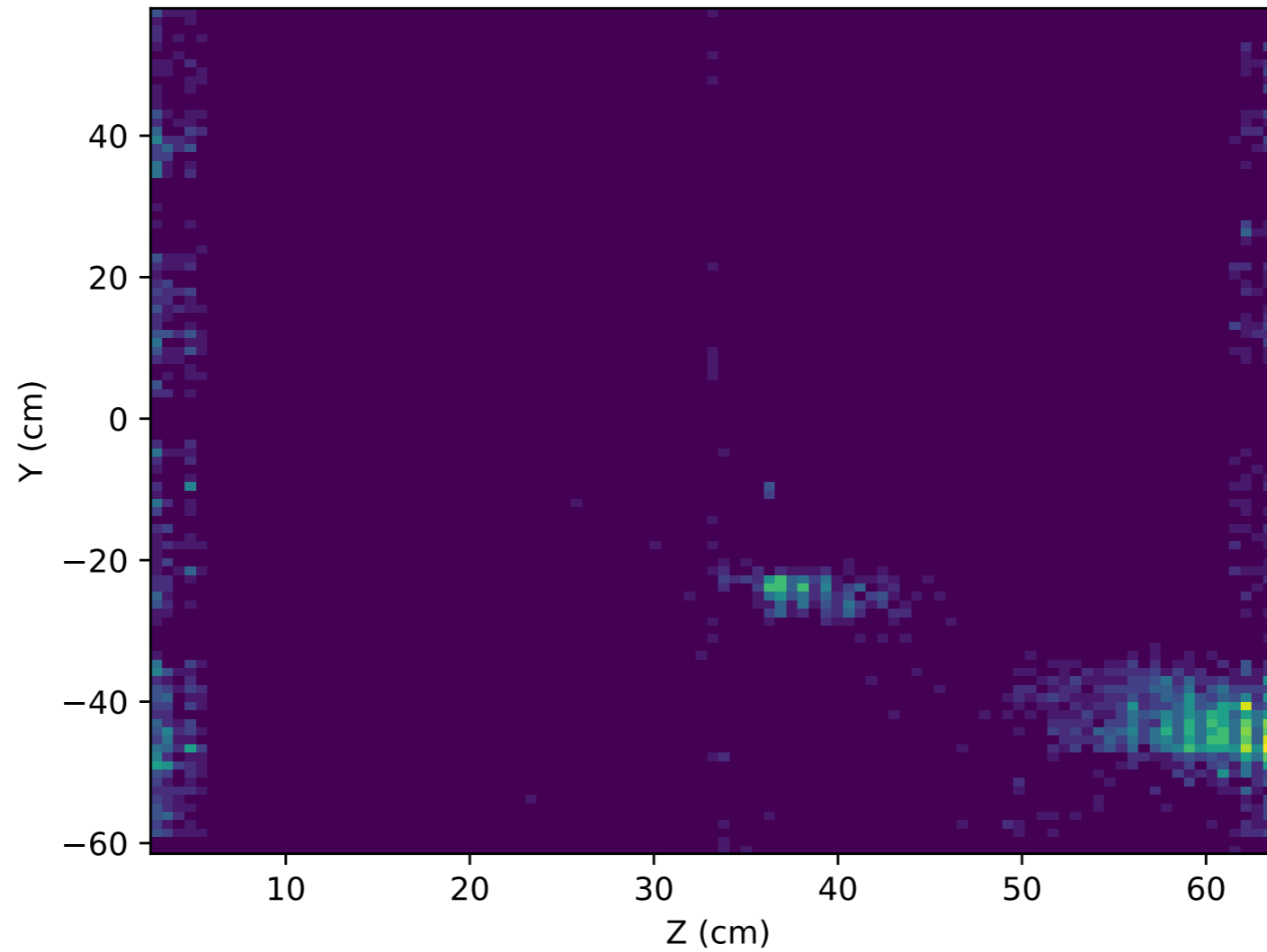
Hit ZY Event 26242

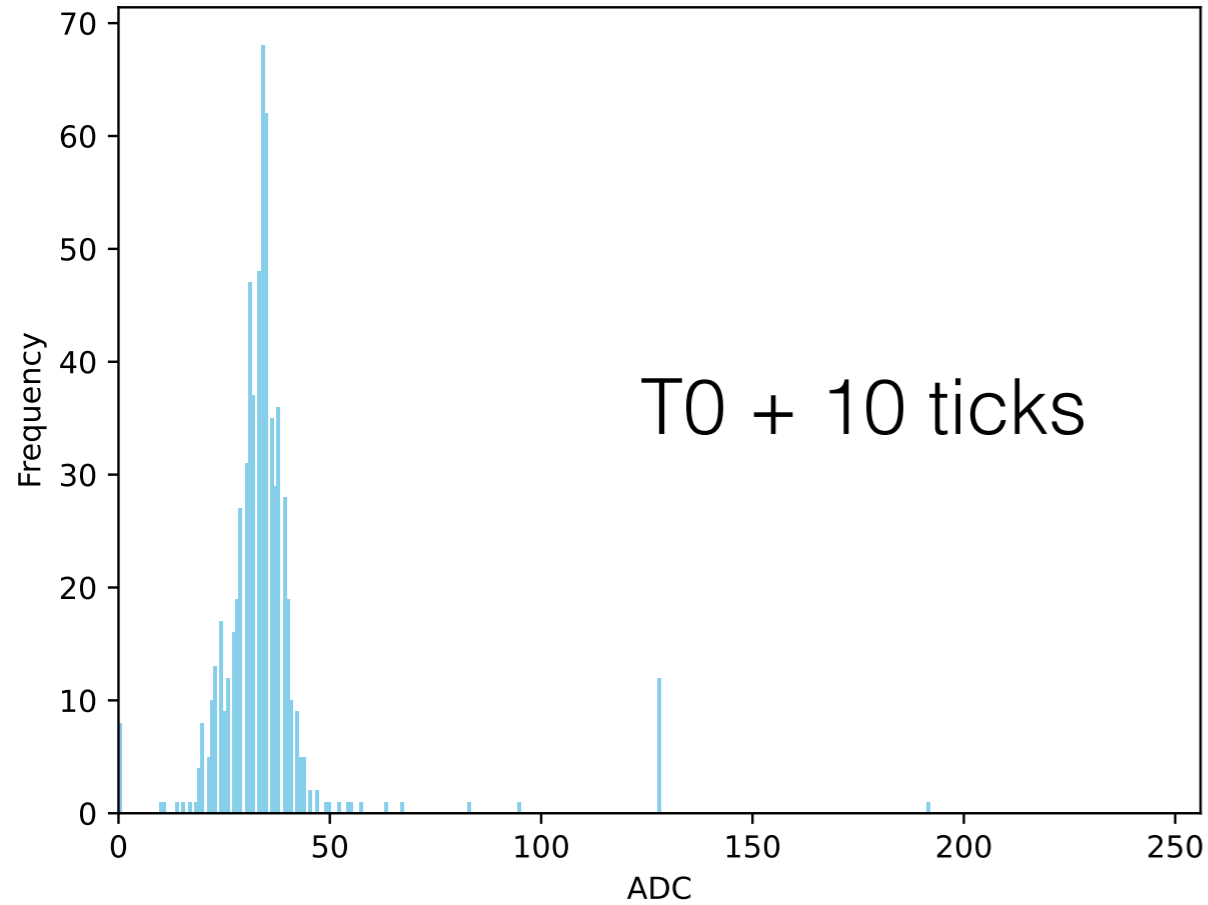T0 + 100 ticks

Hit ZY Event 26242

T0 + 1000 ticks

Hit ZY Event 26242

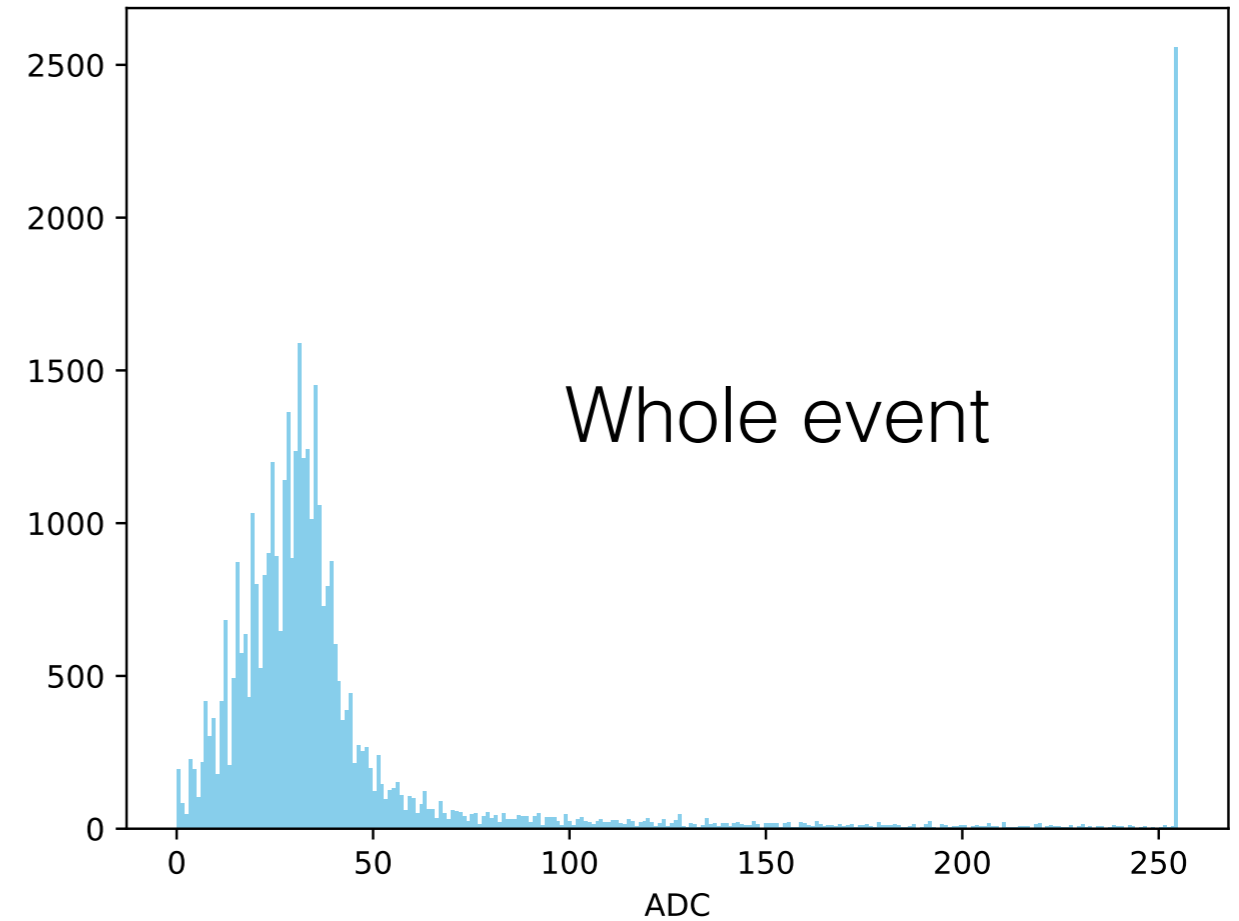- Event time can provide a strong separation between E-board and physics signal

ADC for E-Board Trigger Event

T0 + 10 ticks
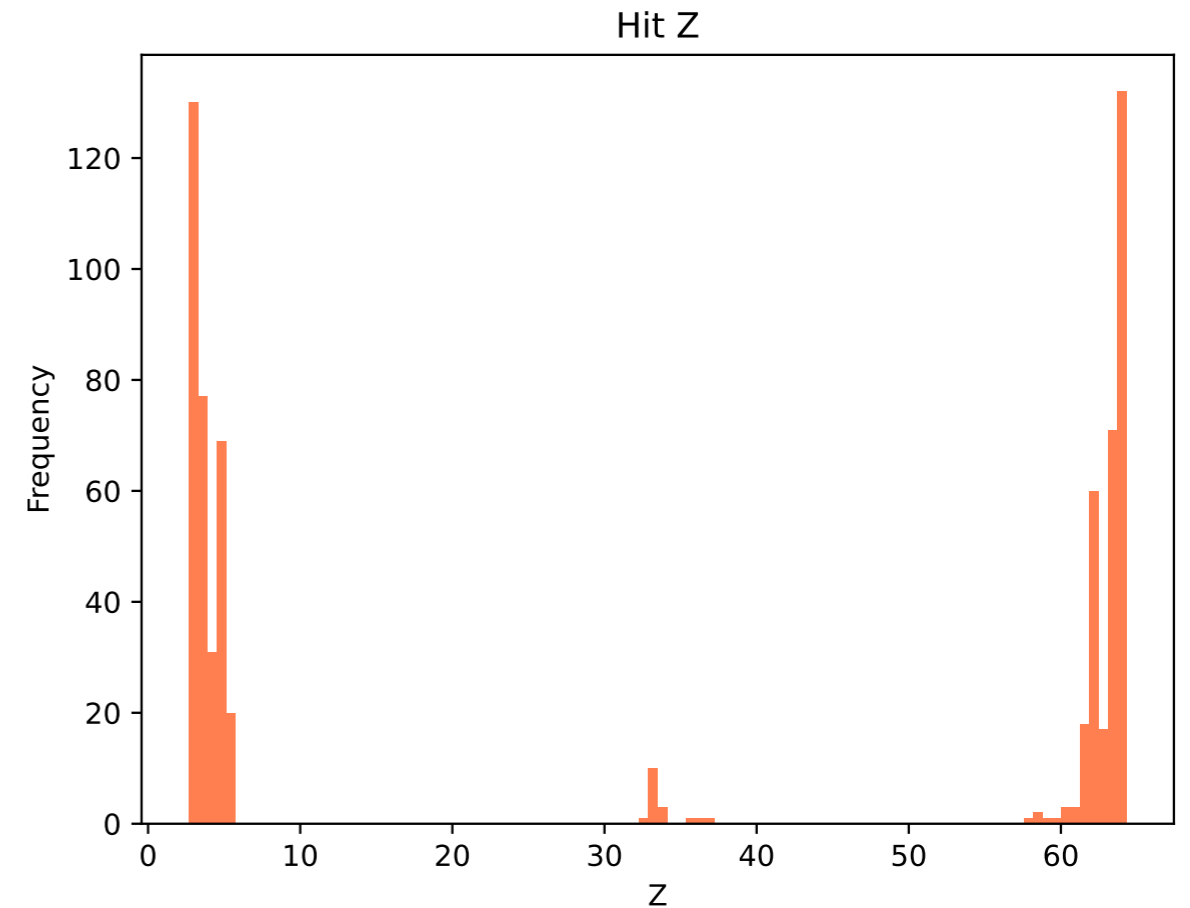
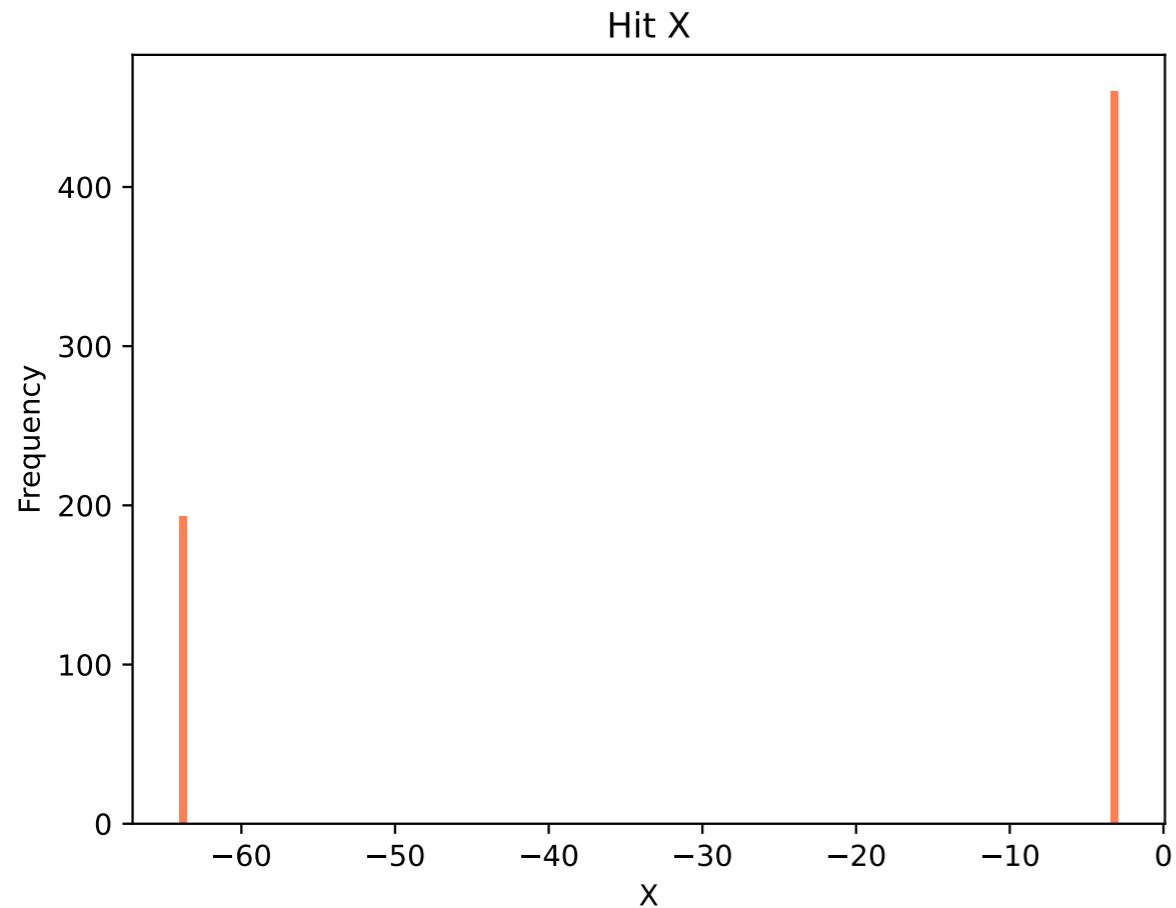**ADC for E-Board Trigger Event**

Whole event

- Small spike around 128 ADC for hits close to t0
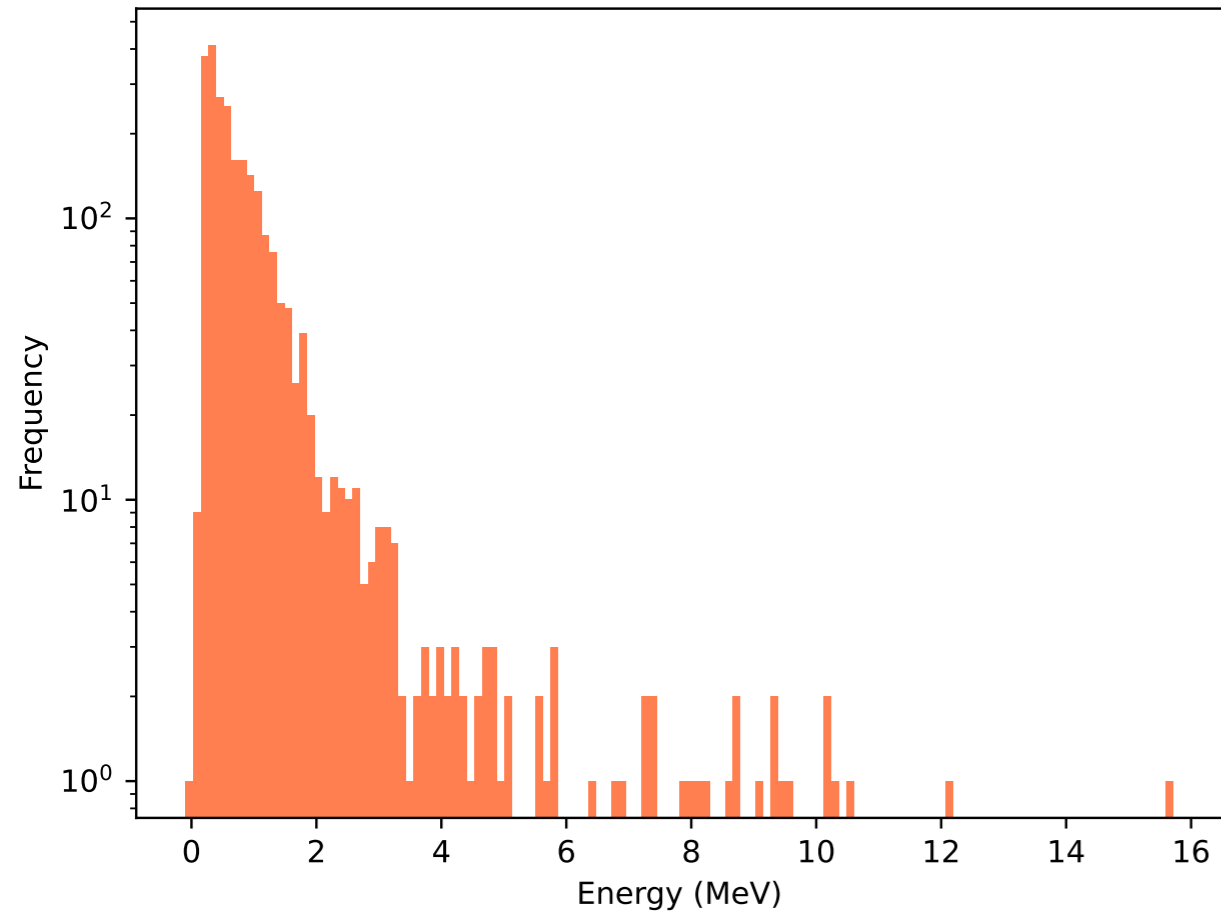
- Hits concentrated along the E-Board lines close to the event start time
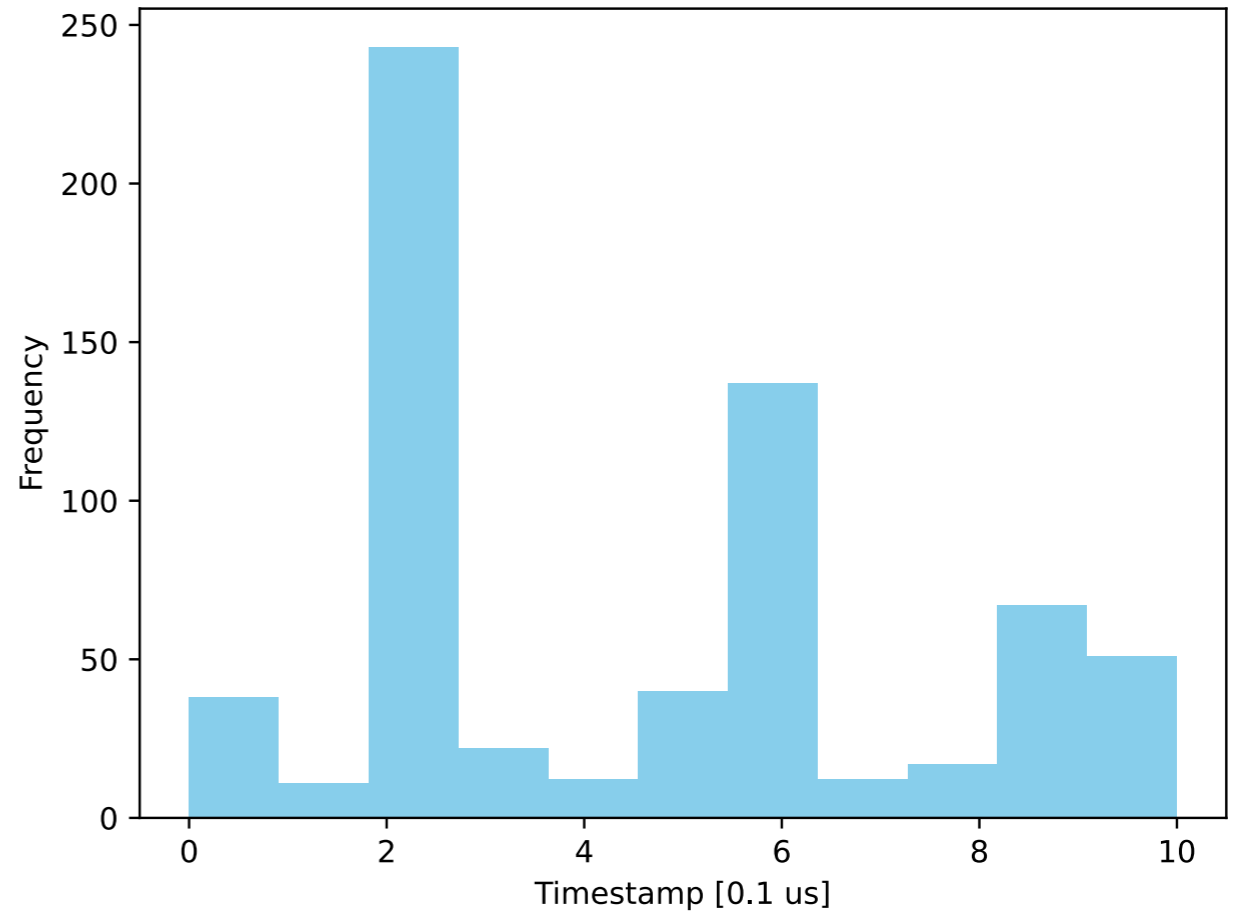
- Use combination of X,Z cut and t0 to select events

Energy in time slice

Time since t0 for E-board Trigger Event

- **Developing algorithm for selecting e-board events ran on 2x2 nominal HV data**

  - Events already known were selected (again)

  - No new candidates found in Module 2 during the physics-quality, nominal HV run with newer method

  - Need to carefully cross-check with Angela's list

- Refine and extend to other modules, half-nominal run, cosmic run....

ADC for E-Board Trigger Event