Long Time Events in the ORCA4 Data

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Introduction

ORCA4 data (83 634 895 events) contains physics and background events

Physics events:

- Atmospheric muons
- Atmospheric neutrinos

background events:

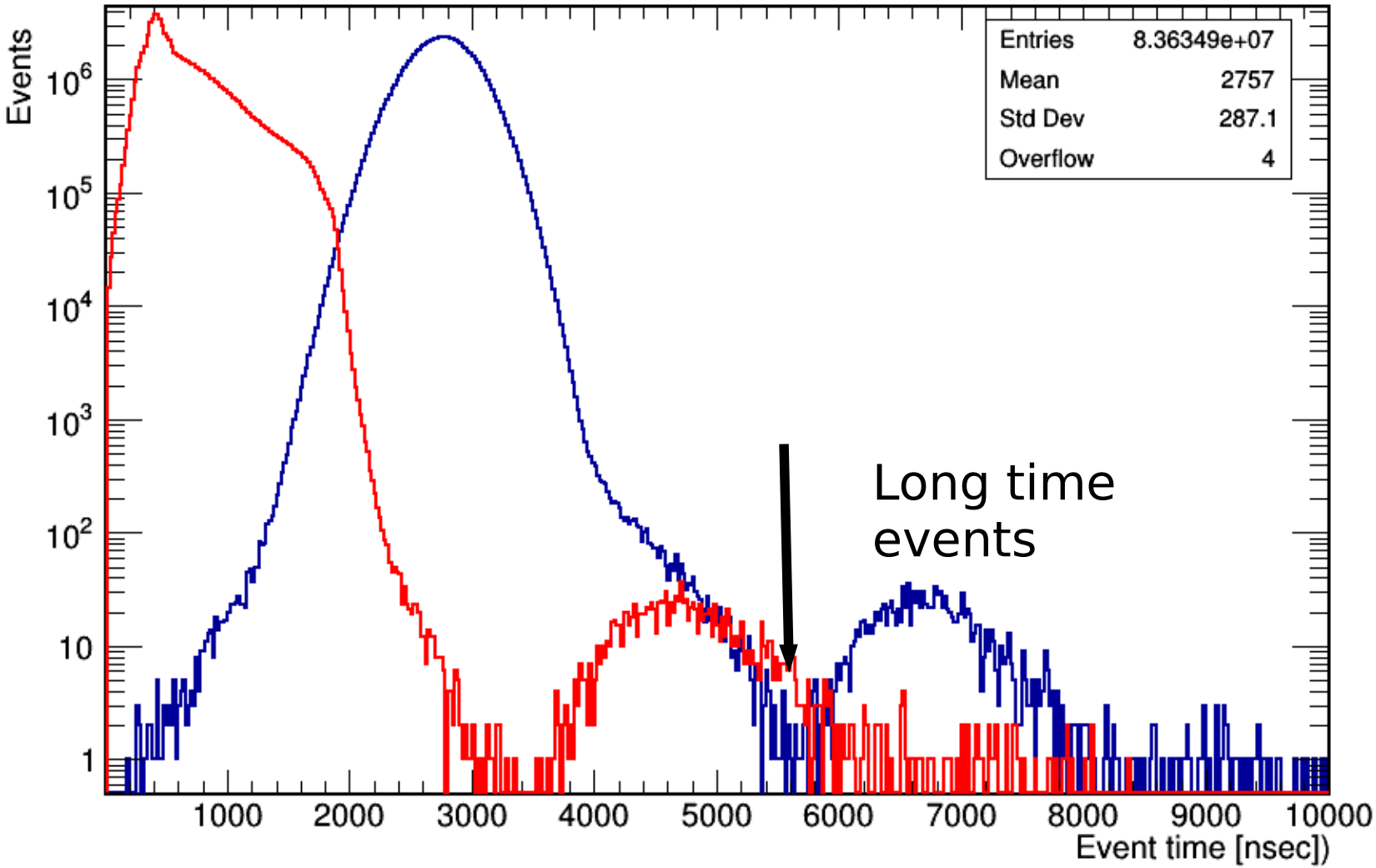
- Environmental background (^{40}K, bioluminescence)
- Instrumental (detector) effects (“Sparking DOMs“, . . .)

Background events could mimic low probability physics events →
These events should identified, studied (and removed)

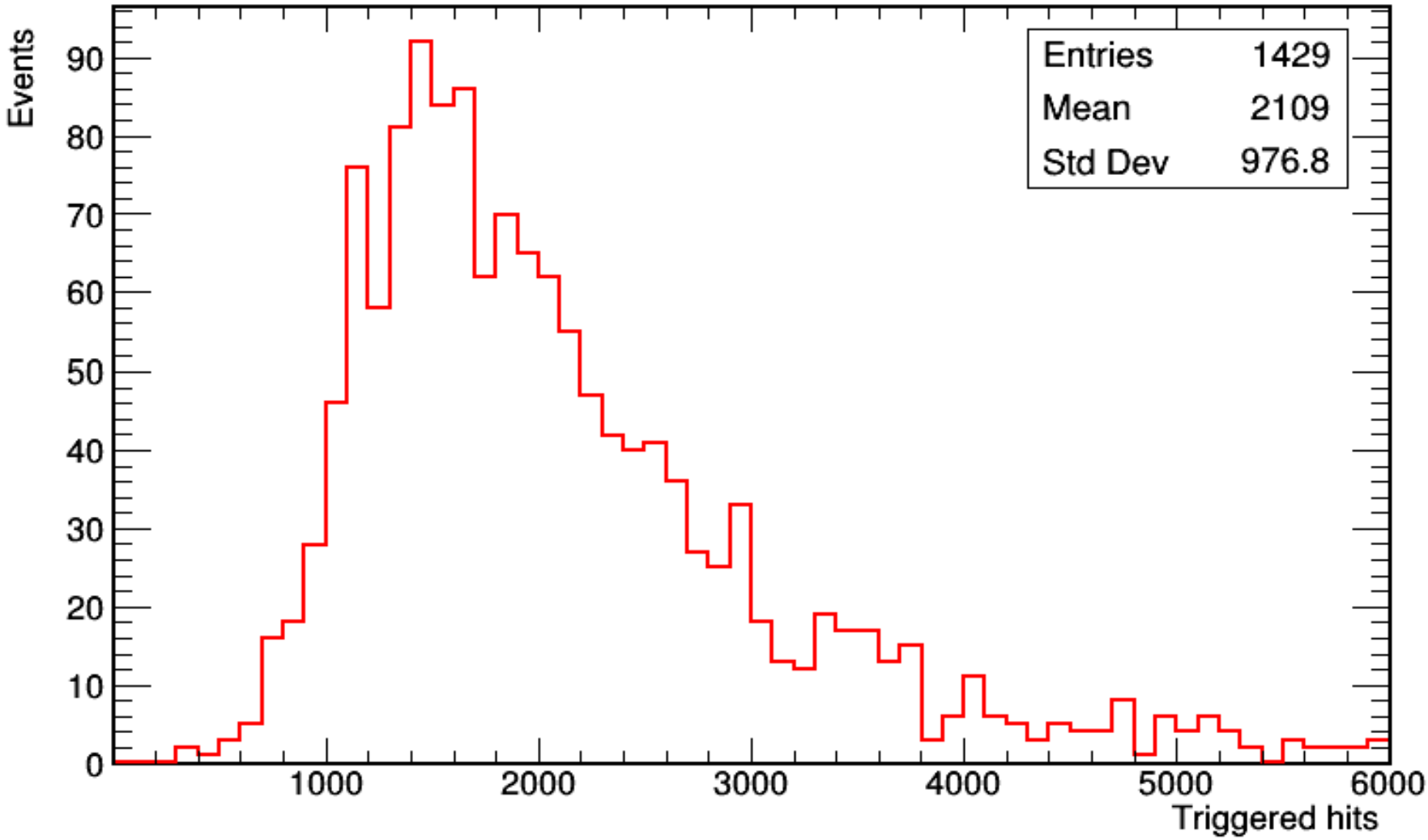
ORCA4: Event time

All processed/reconstructed events: 83 634 895 (8.4×10^7 events)

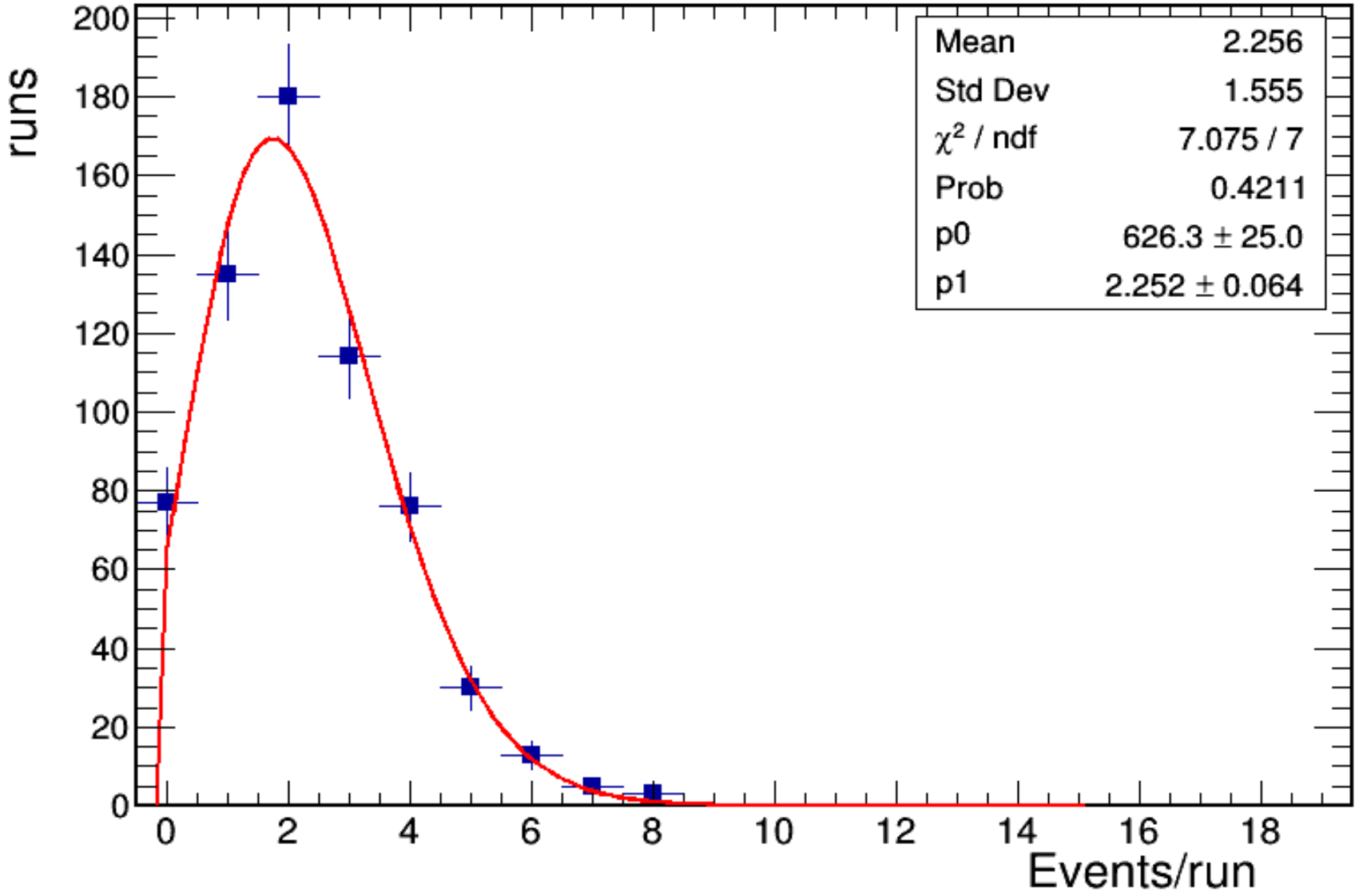
Events $\Delta t > 5600$ nsec: 1429 (1.7×10^{-5} off data)



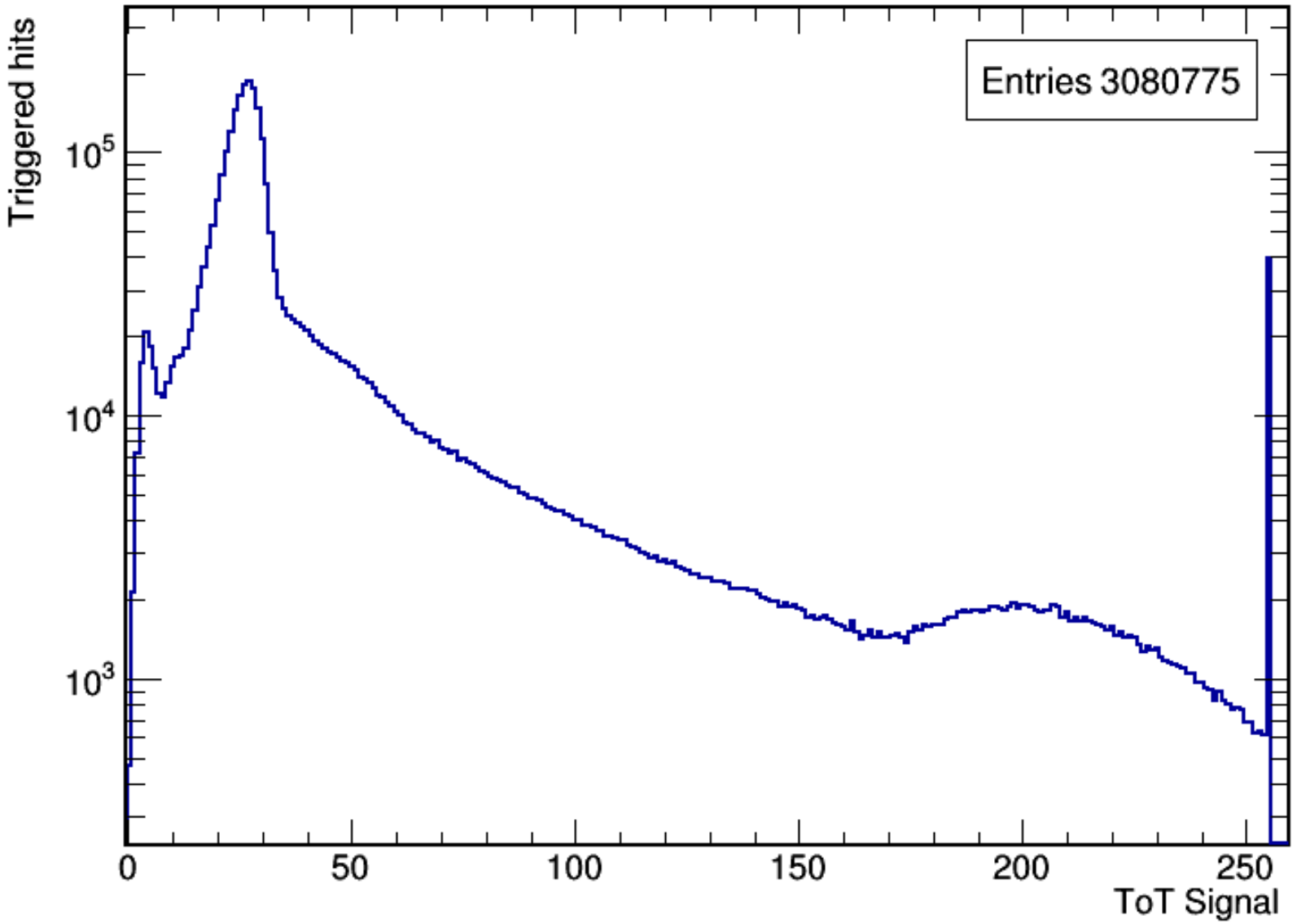
Triggered Hits



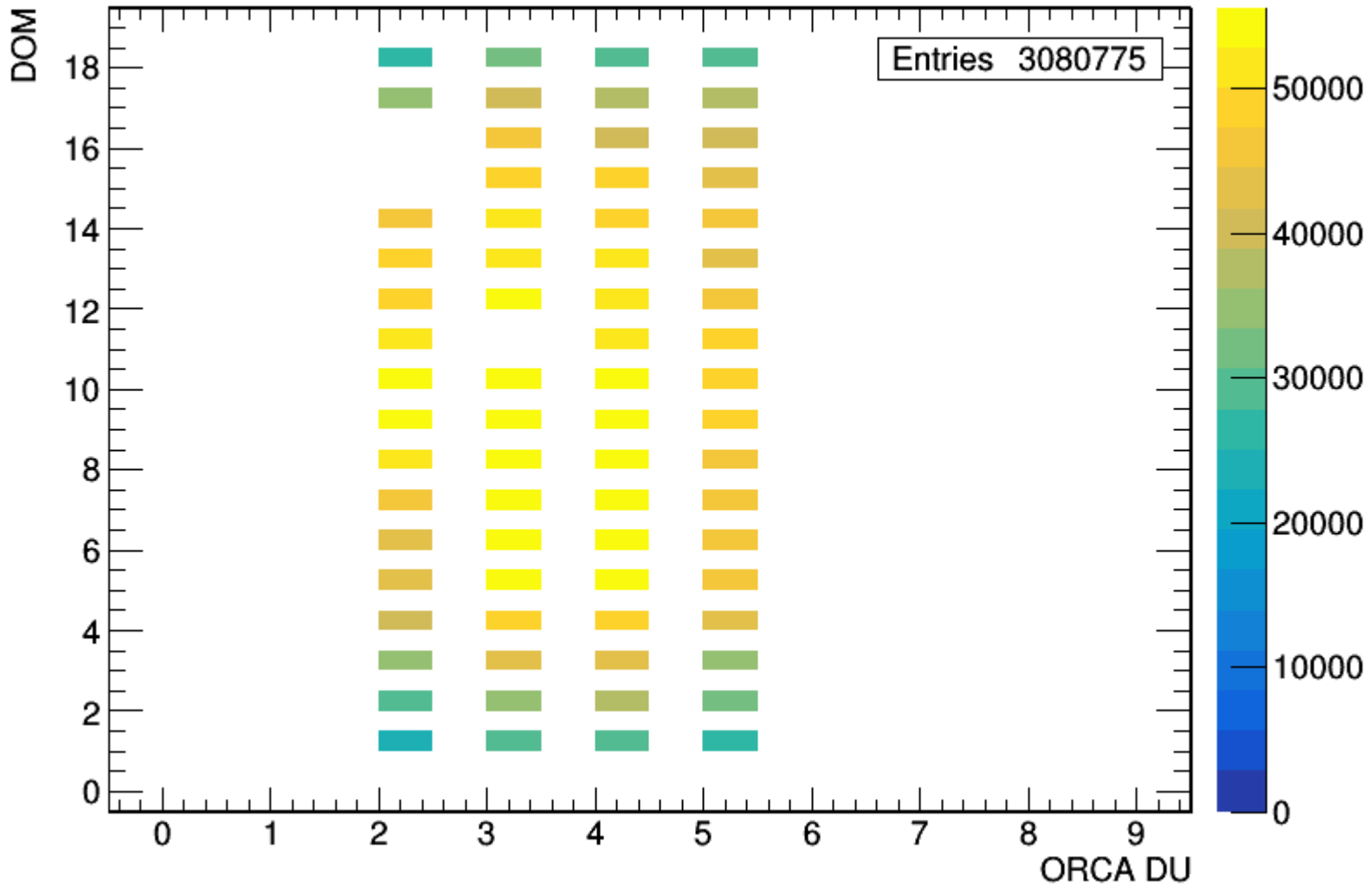
Events per Run



ToT for Triggered Hits

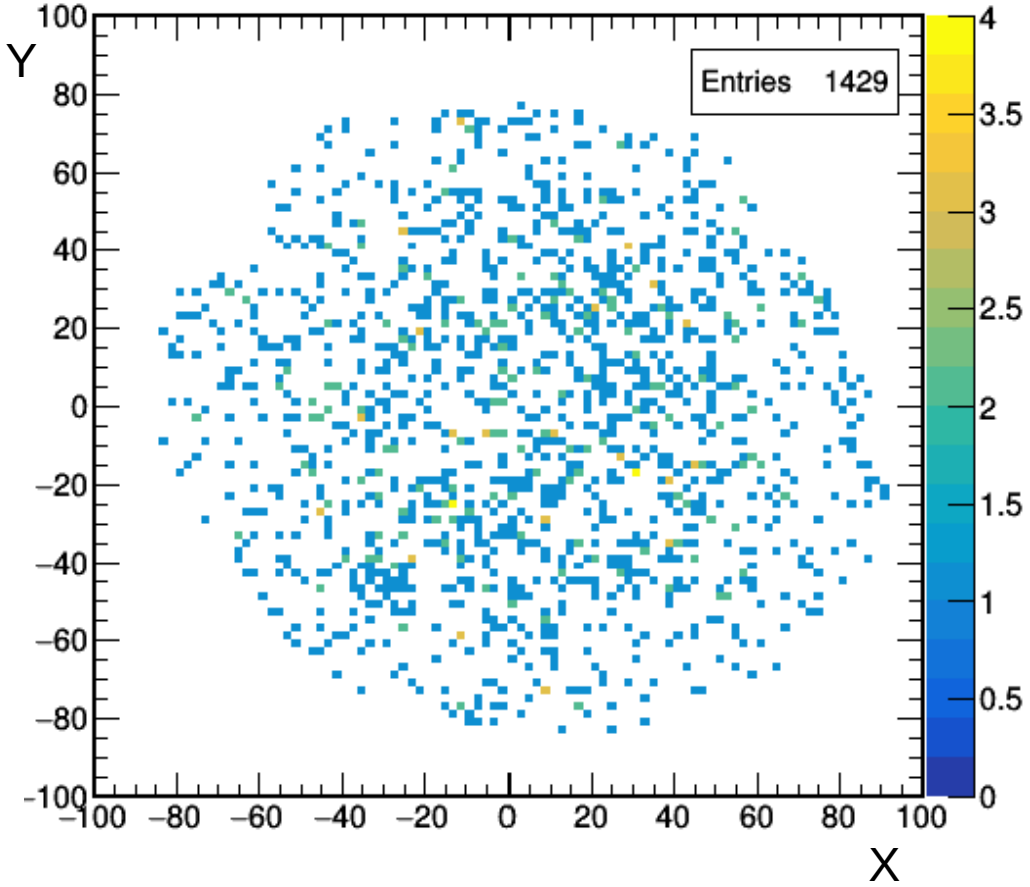


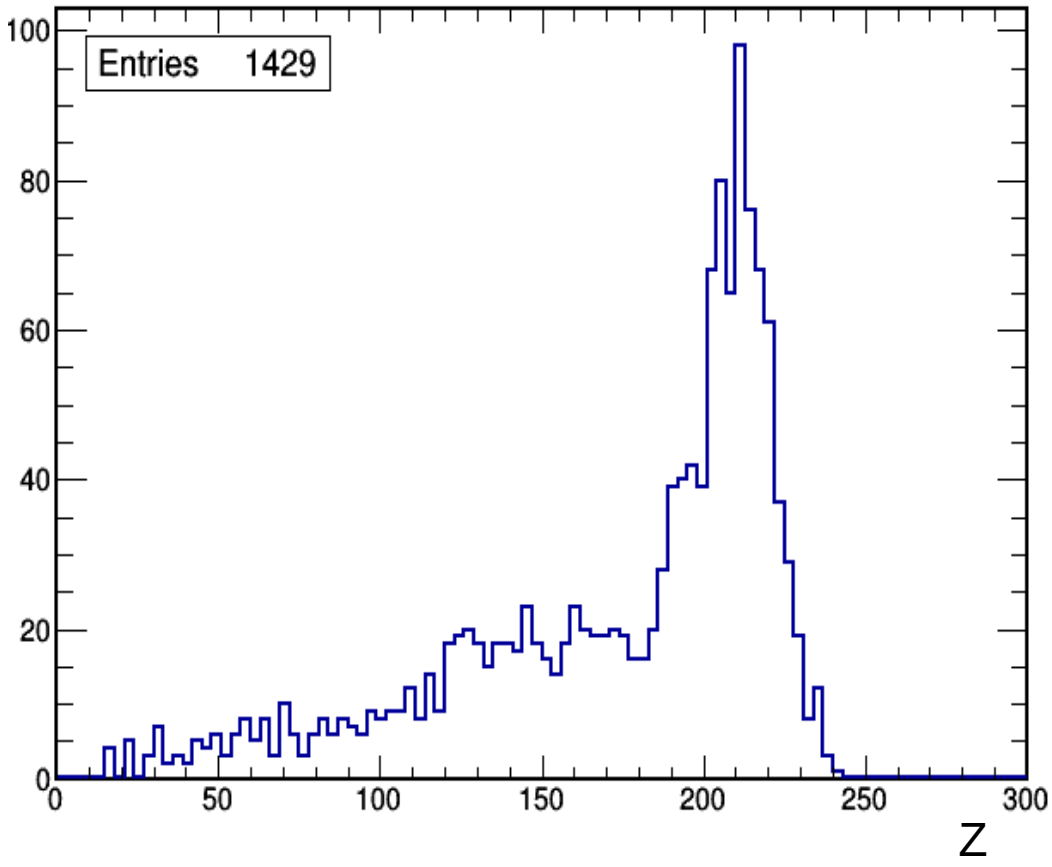
Triggered Hits on ORCA4 DOMs



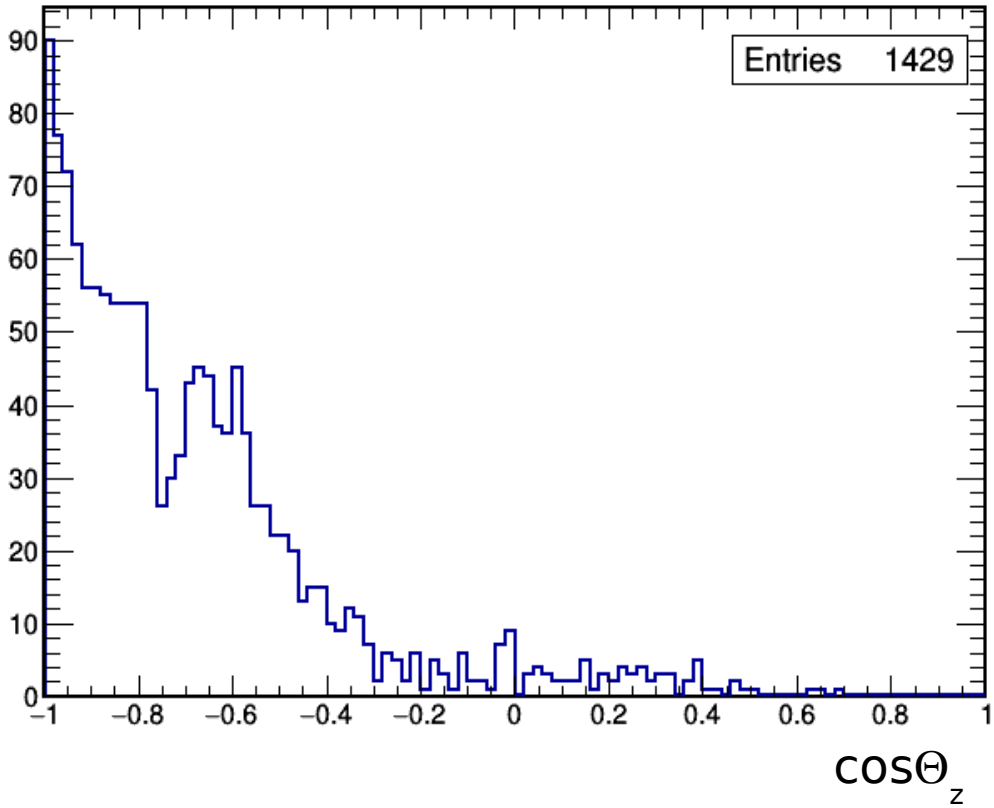
Reconstructed Track Parameters

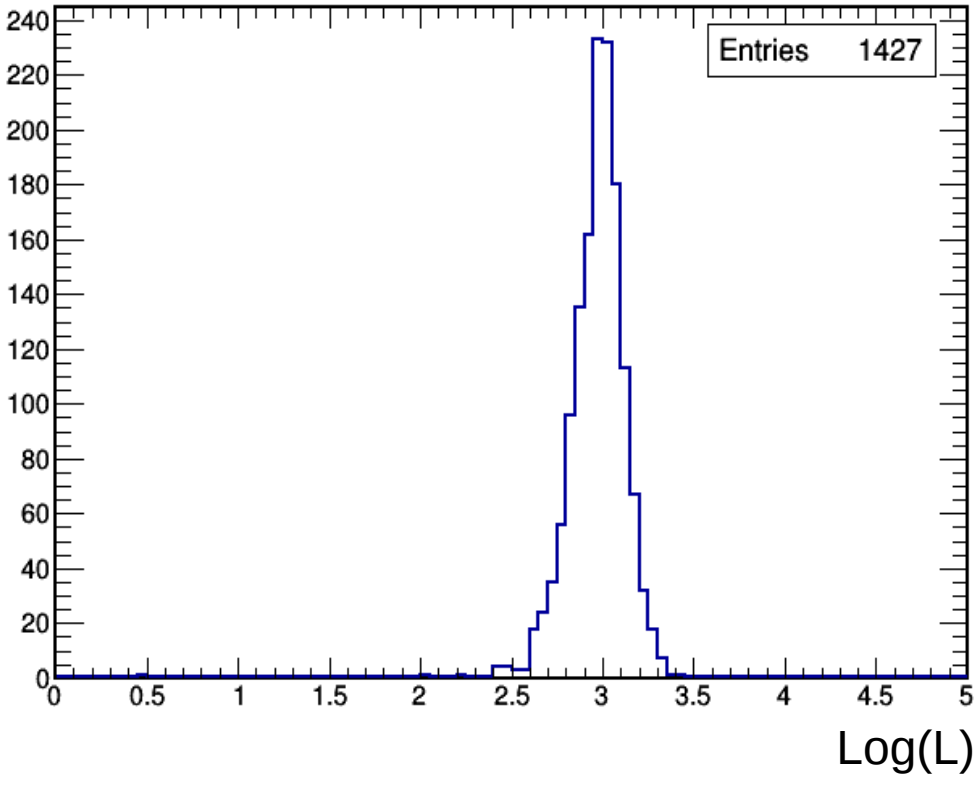
Track Position





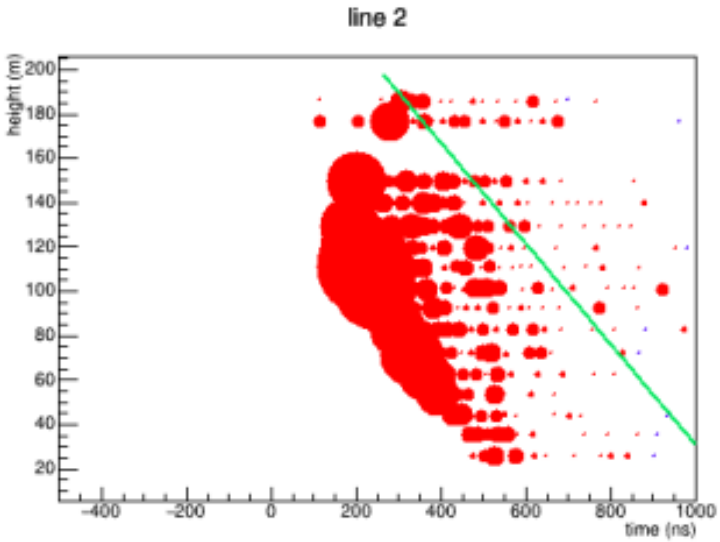
Reconstructed Track Parameters

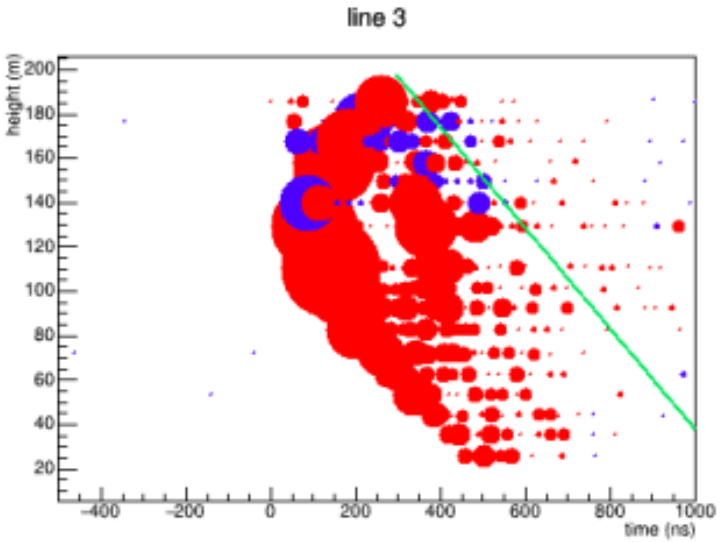


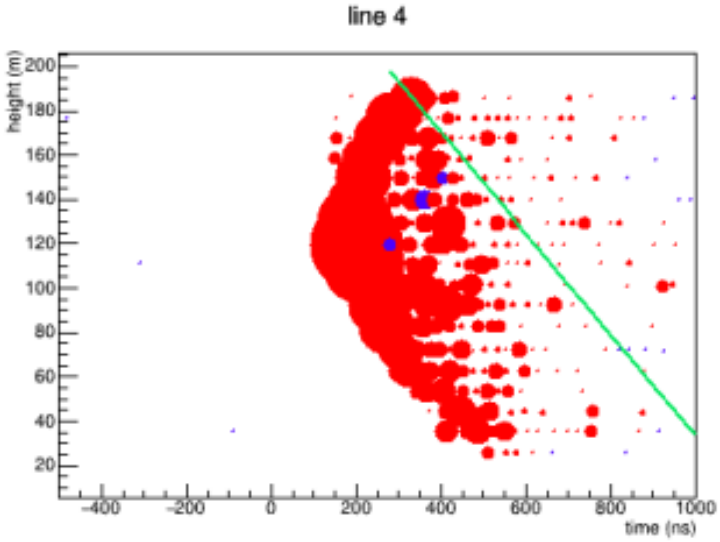


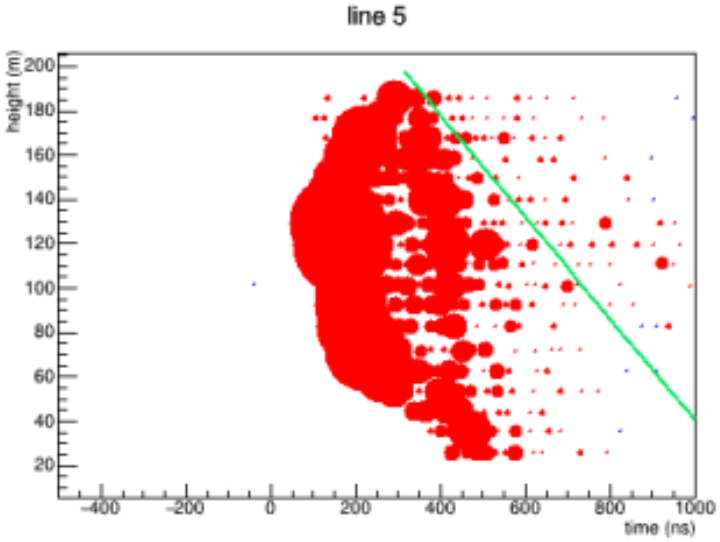
Long Time Event Display

Run ID: 6502 Event ID: 48557



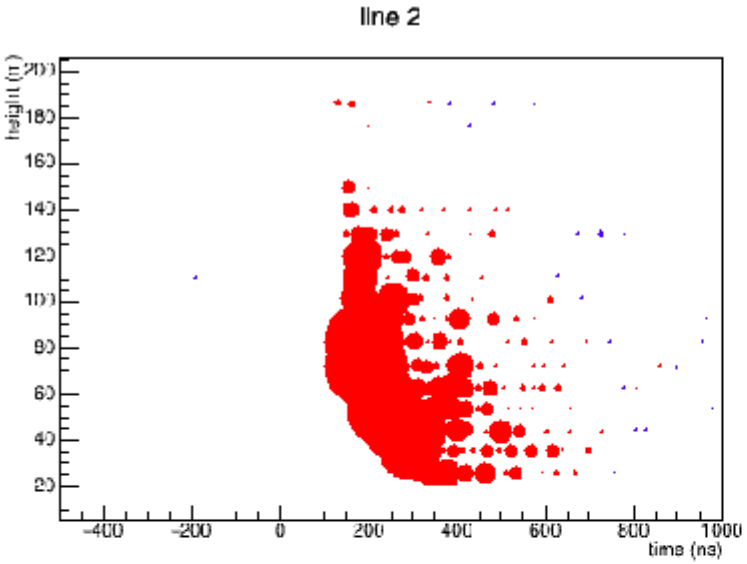


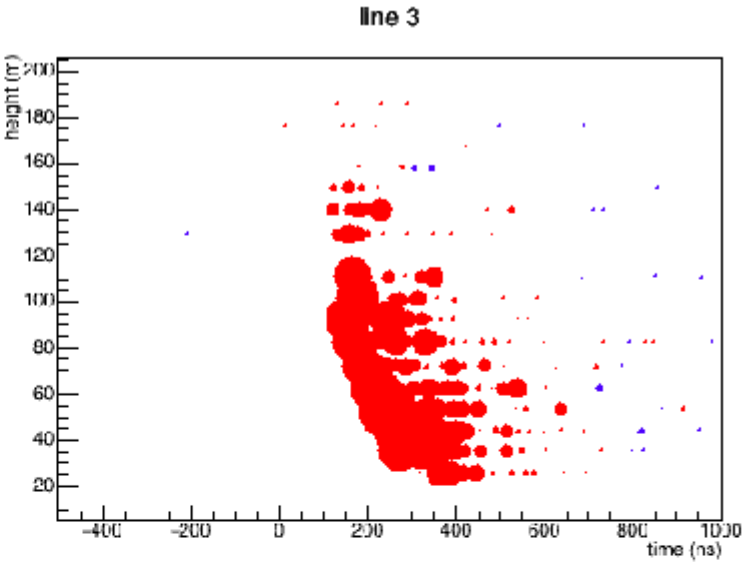


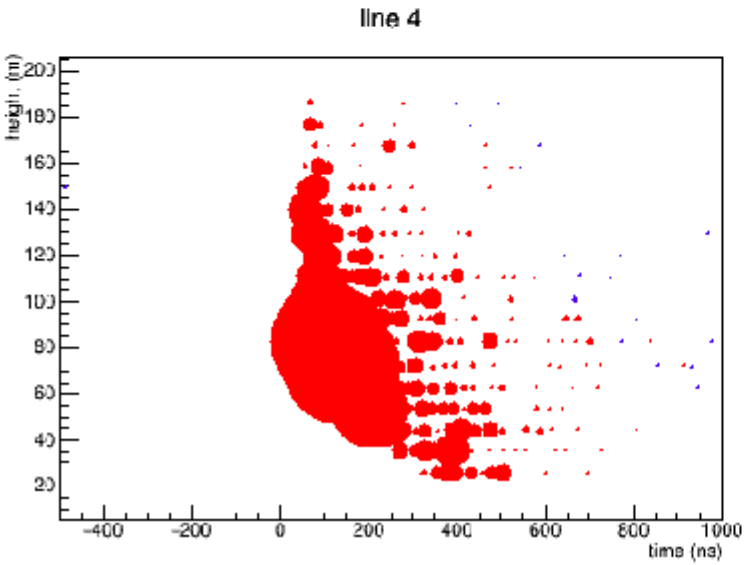


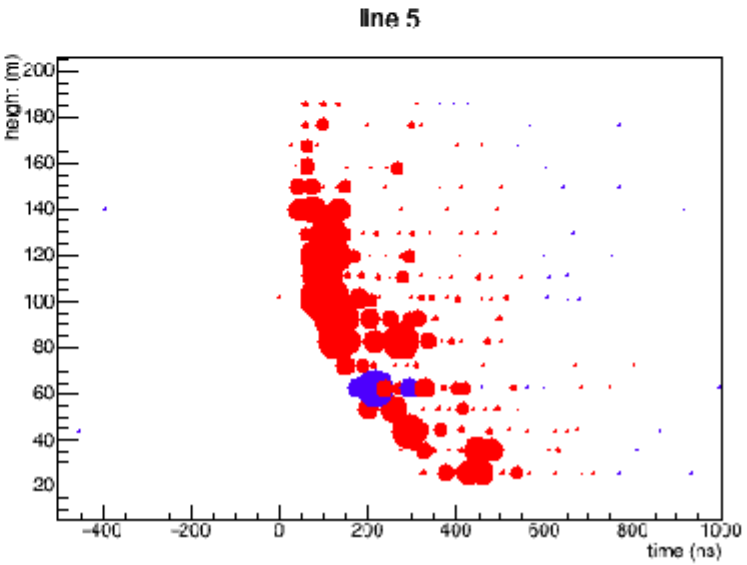
Long Time Event Display

Run ID: 5899 Event ID: 101108



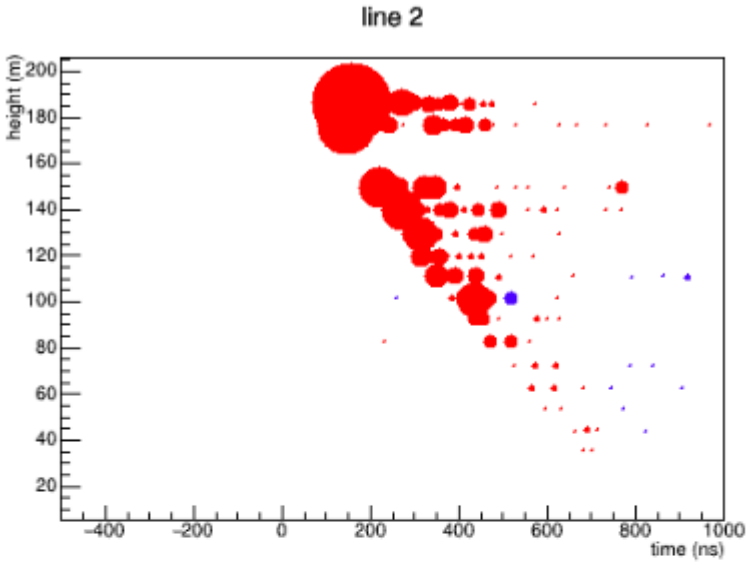


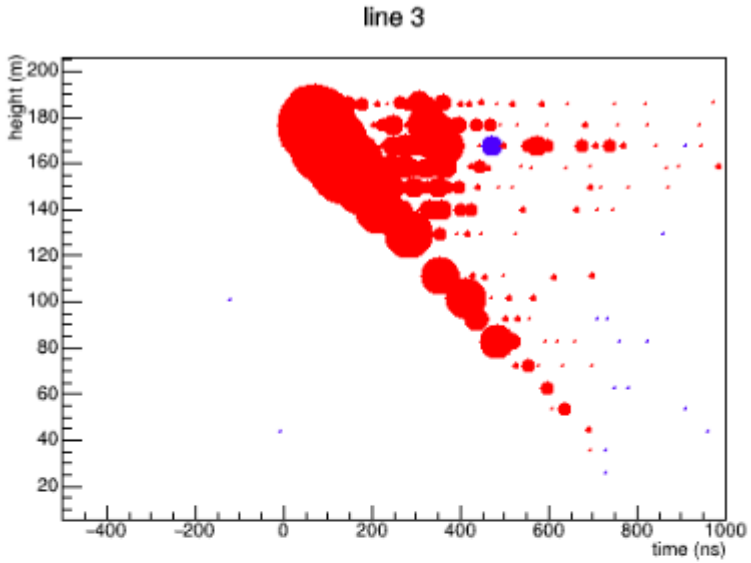


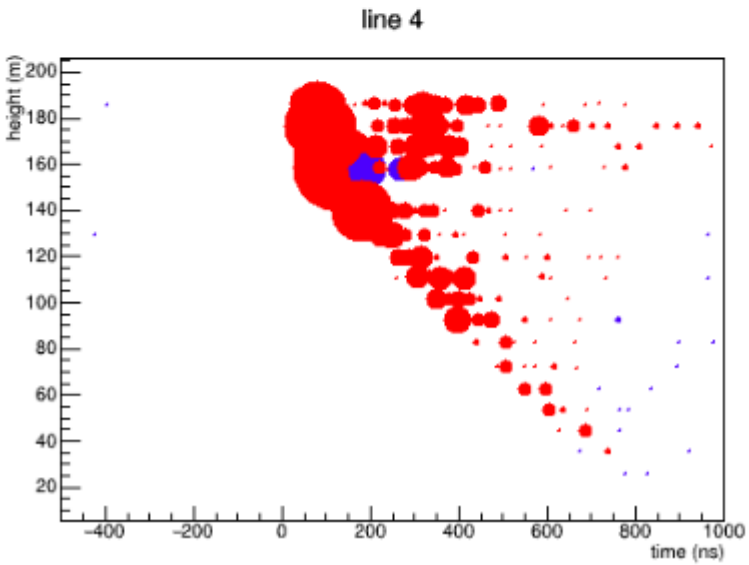


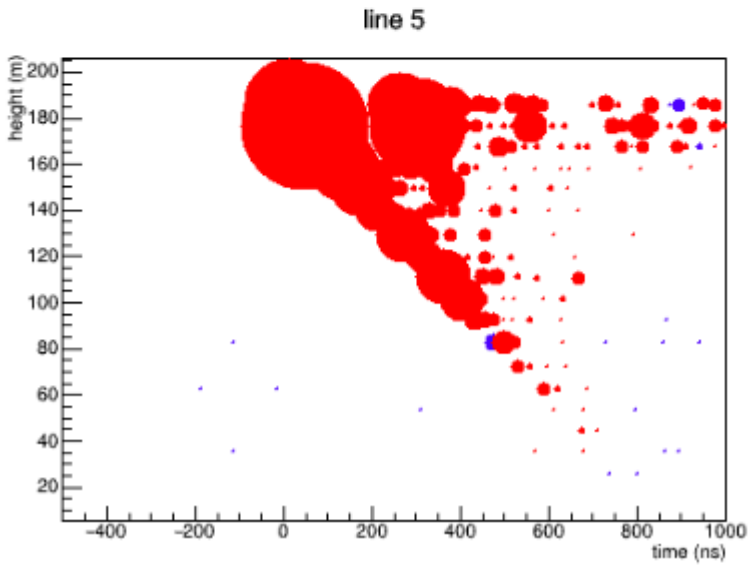
Long Time Event Display

Run ID: 7005 Event ID: 86436



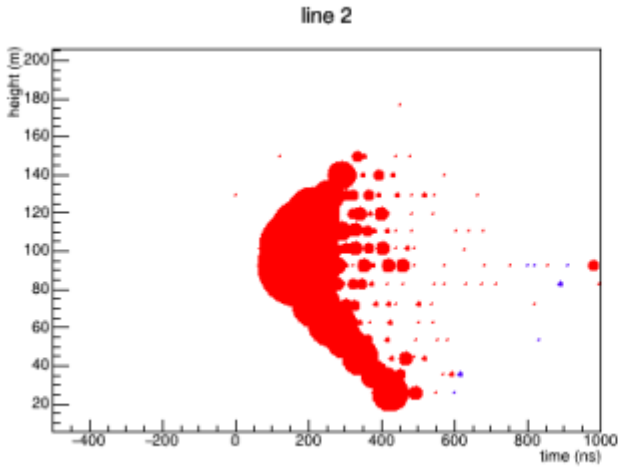


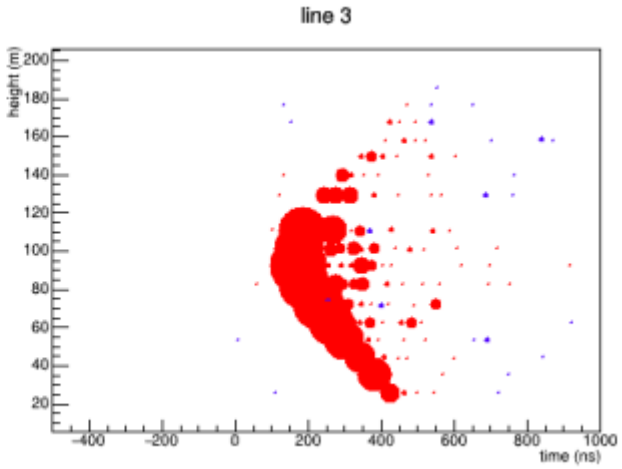


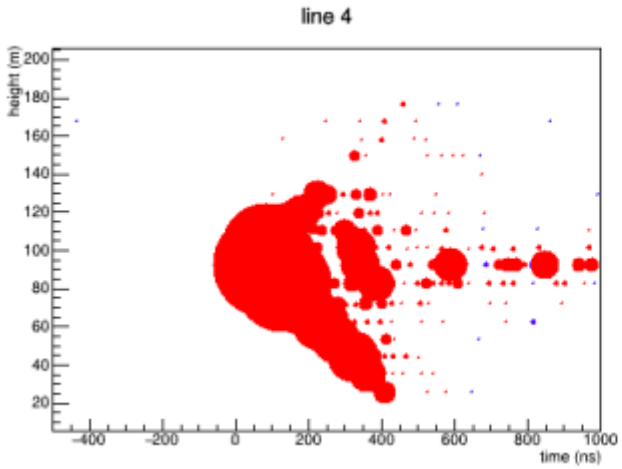


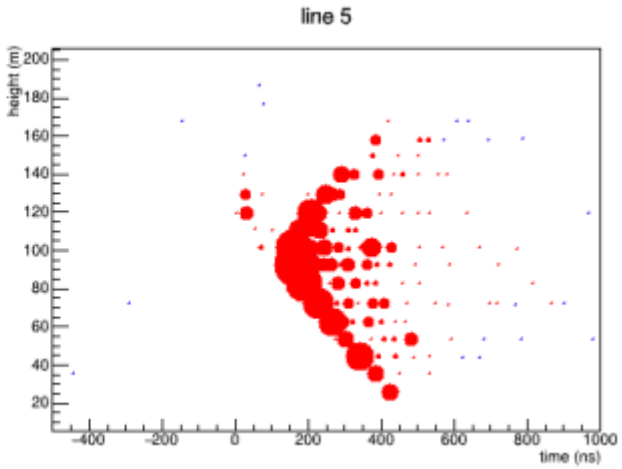
Long Time Event Display

Run ID: 6581 Event ID: 33629









Summary and Outlook

- ORCA4 data contains events with the long ($\Delta t > 5600$ nsec) time
- Long time events (1429) are very small part (1.7×10^{-5}) of the data
- Triggered hits from these events are mainly in the central part of the ORCA4 detector
- Track reconstructed in these events have “normal“ parameters
- The Cause of long time events in the ORCA4 data is currently unclear
- More studies are necessary
- ORCA4 long time events (run, id) will be available from elog entry