



ORCA4 Sparking DOMs



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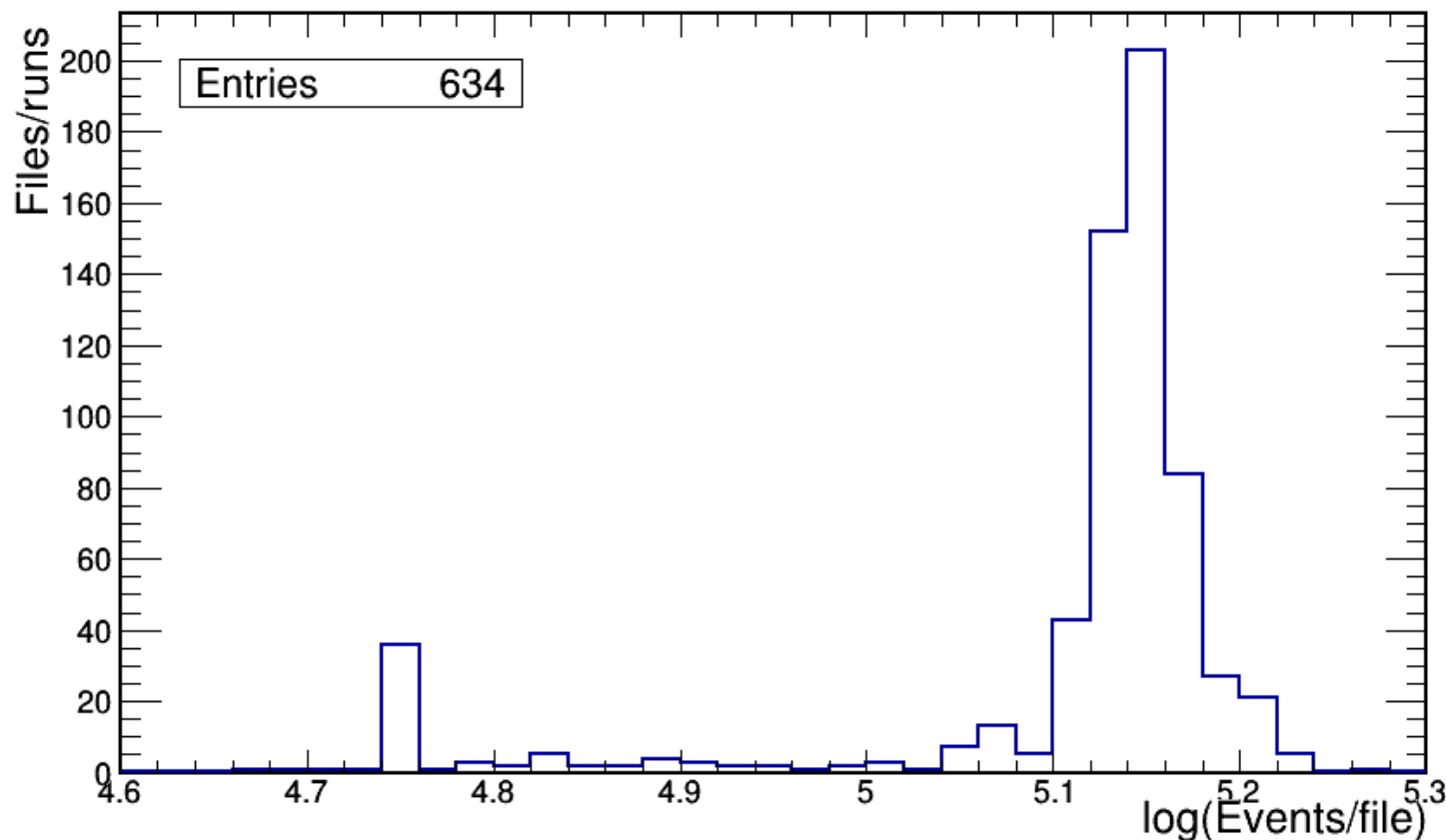
Introduction

- **Problem of Sparking DOMs is a part of the events with largest possible hit (PMT) signal (ToT255)**
- **ToT signals up to now are not included in the KM3NeT MC**
- **We have selected ORCA4 events with at least one ToT255 signal (ToT255 events).**
- **Preliminary analysis of ORCA4 ToT255 events from 634 runs**
- **Summary and Outlook**

ORCA4 Event Sample

ORCA4 processed data: 634 data files (aanet-format)

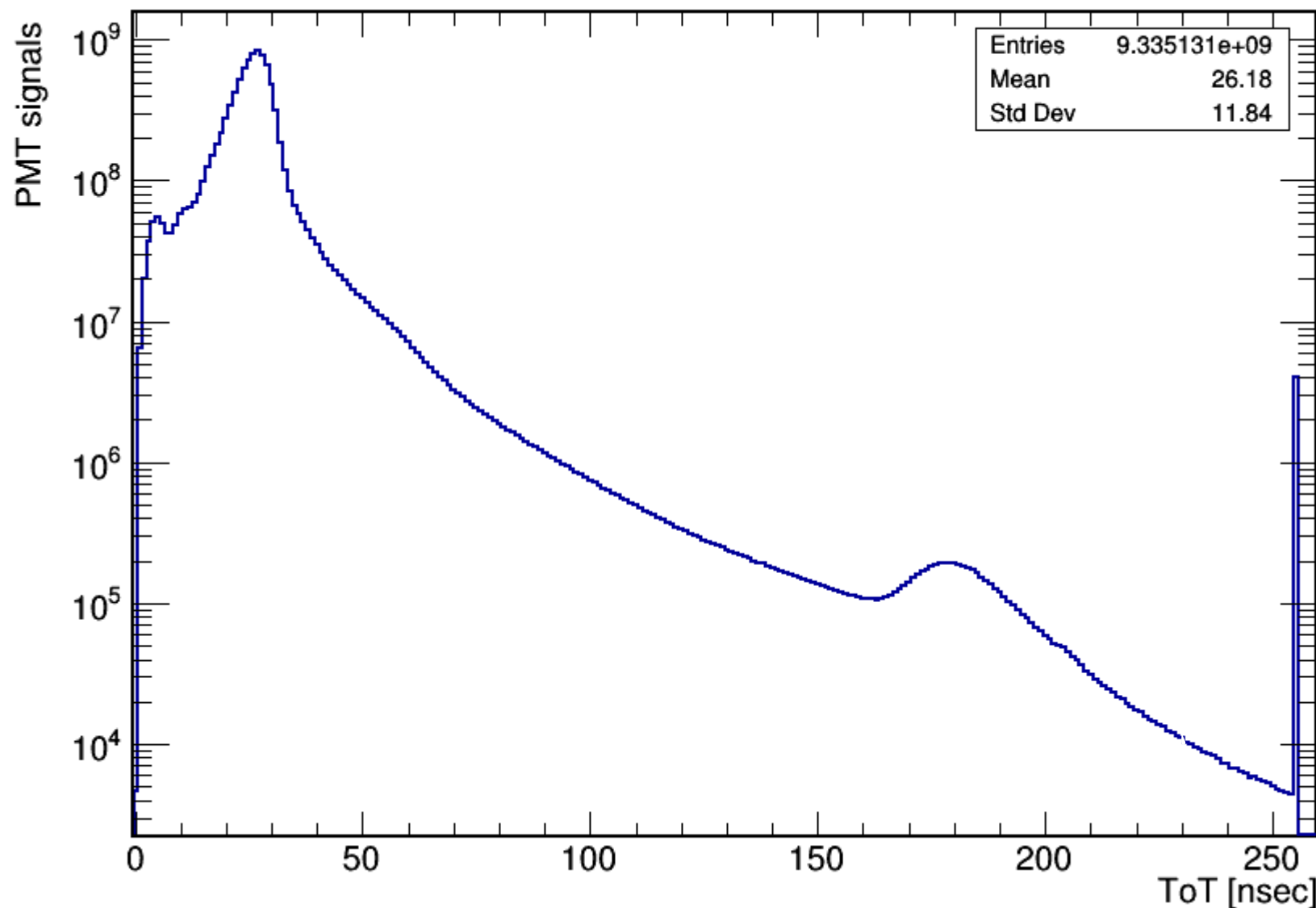
All processed/reconstructed events*: 83 634 895 (8.4×10^7 events)



* <https://elog.km3net.de/Analysis/620>

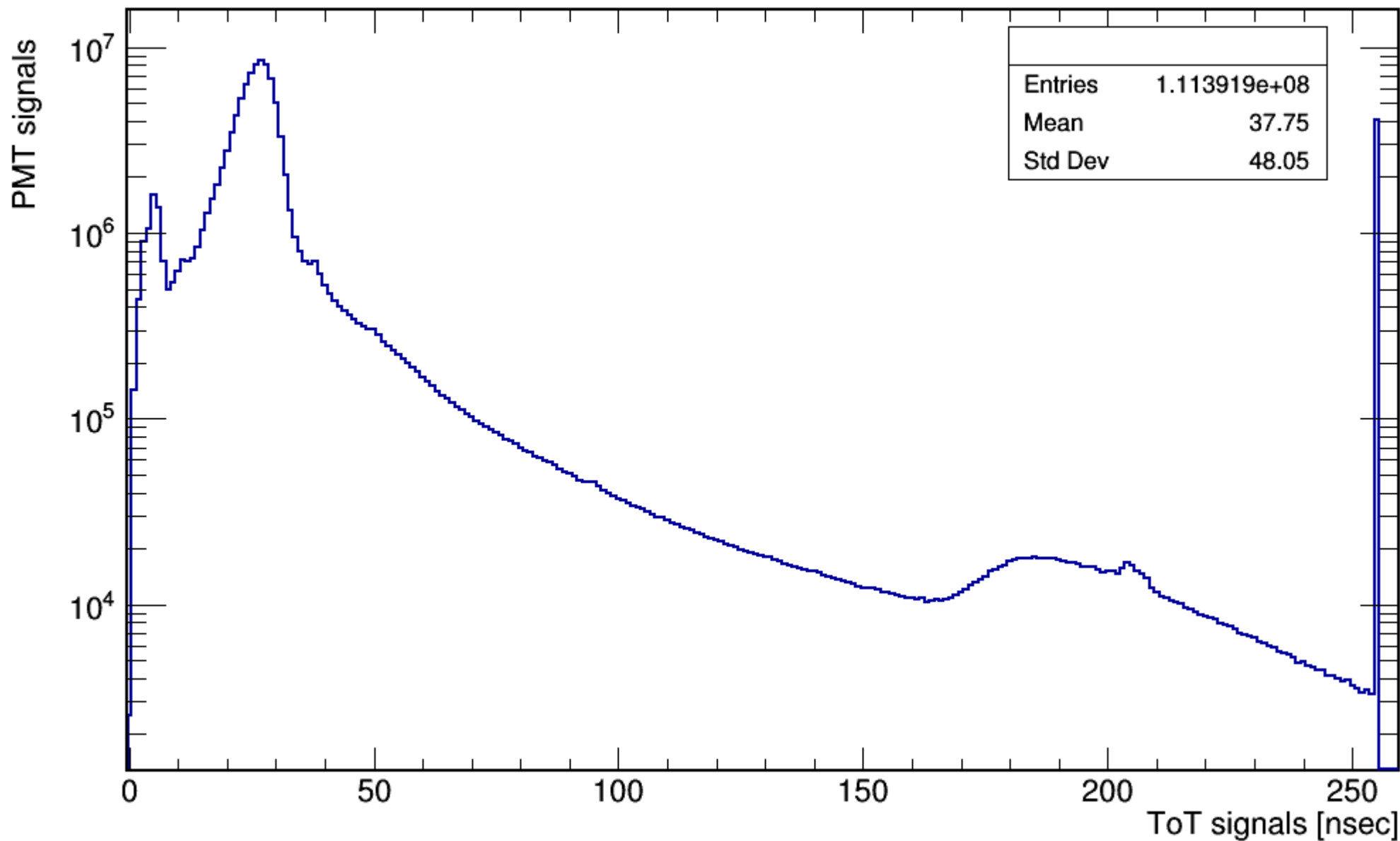
ToT Signal in the ORCA4 events

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

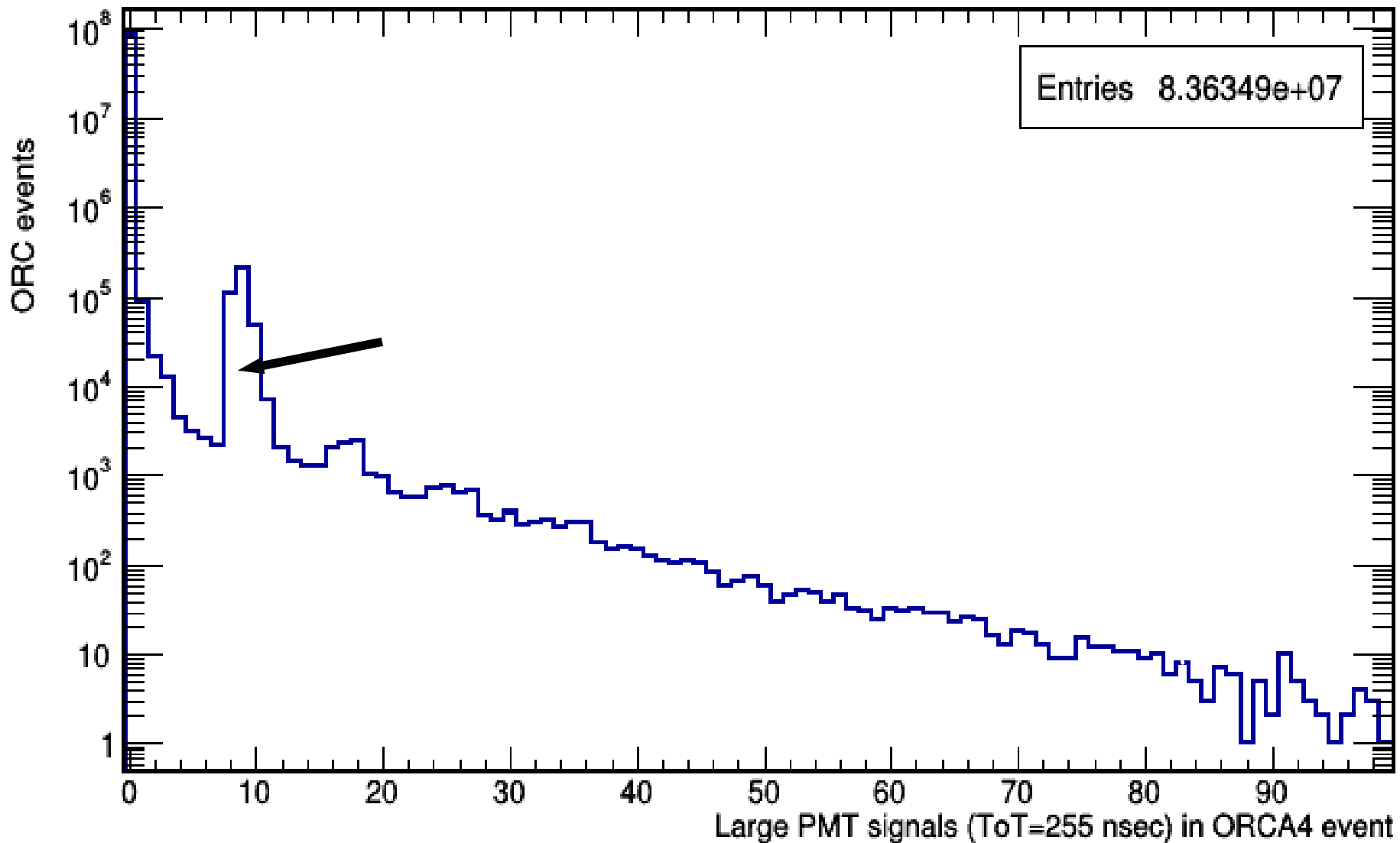


ToT255 event: events with at least 1 hit with ToT=255 nsec

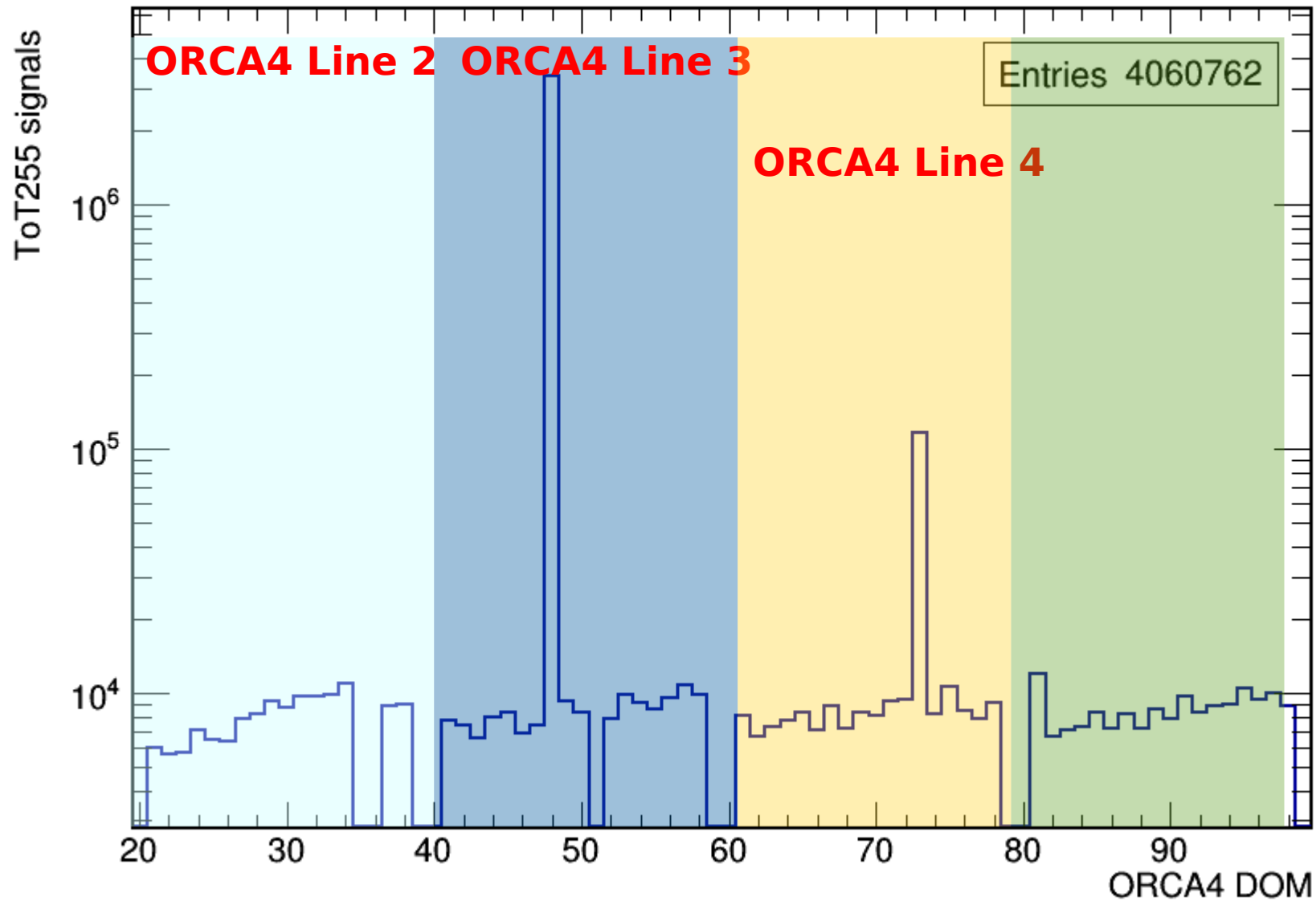
ToT Signal in the ToT255 events



ORCA4 ToT255 Events

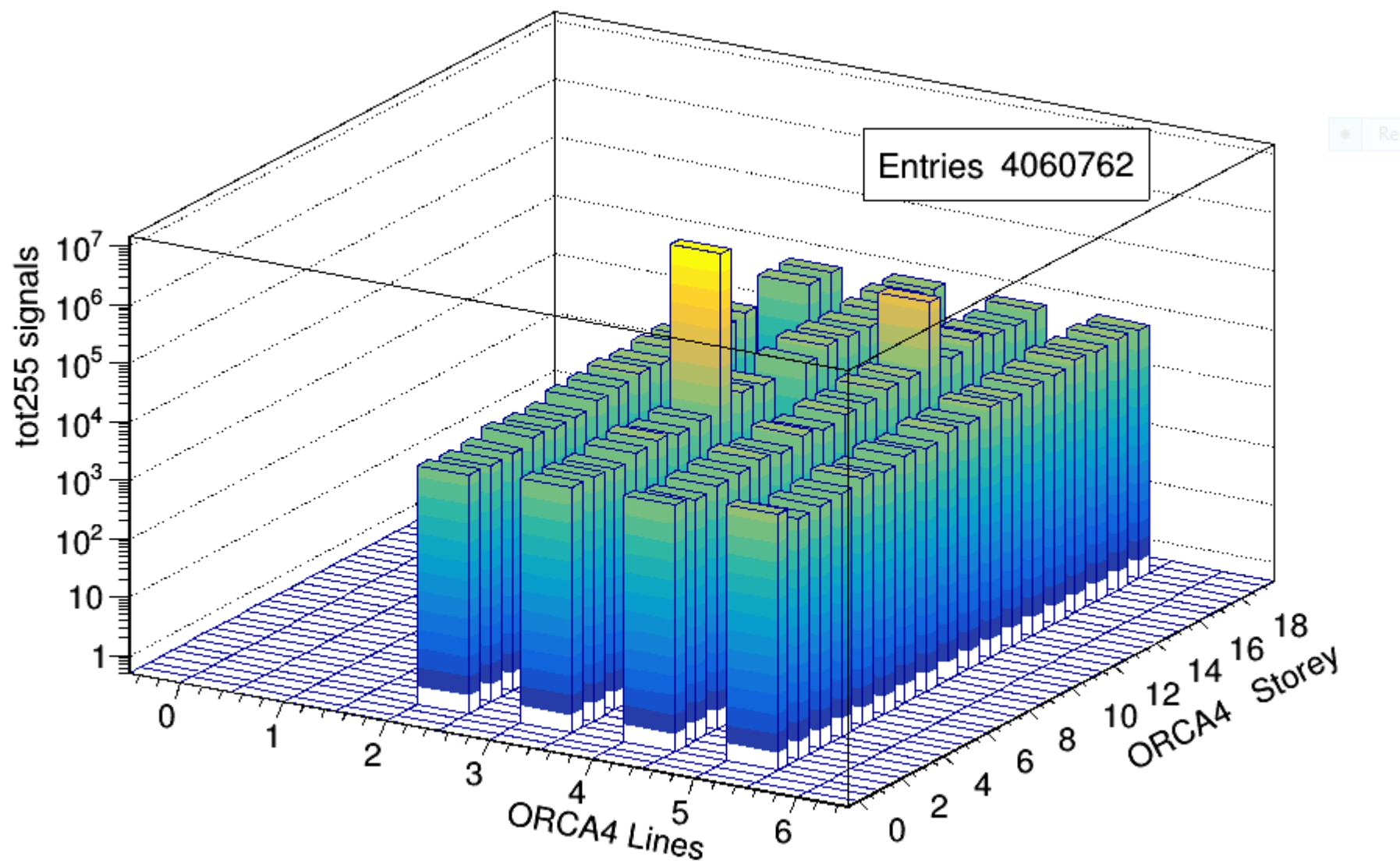


ToT255 DOMs

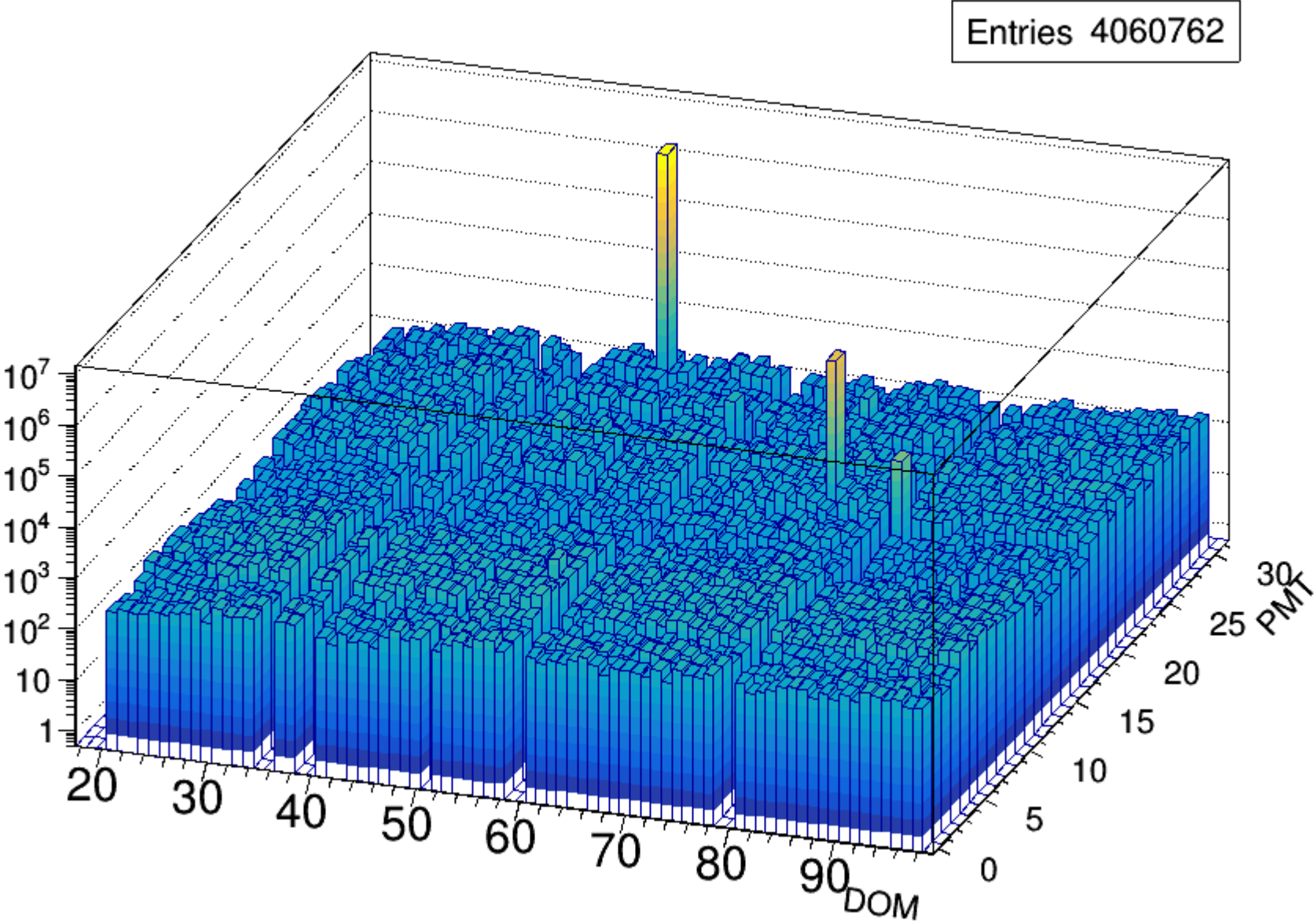


DOM on Line 3 (dom id: 808447180) is a source of large signals

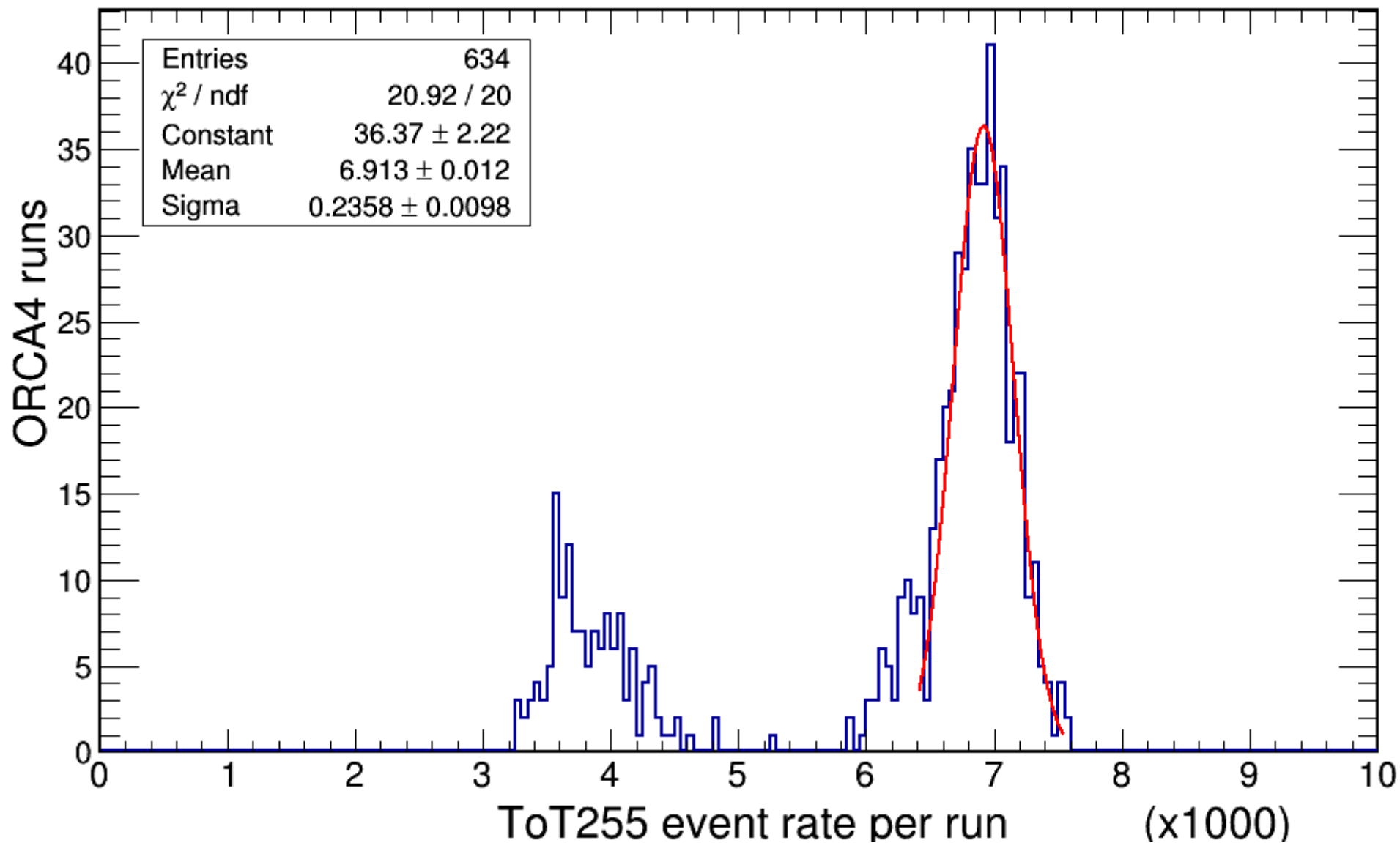
ORCA4 ToT255 Events



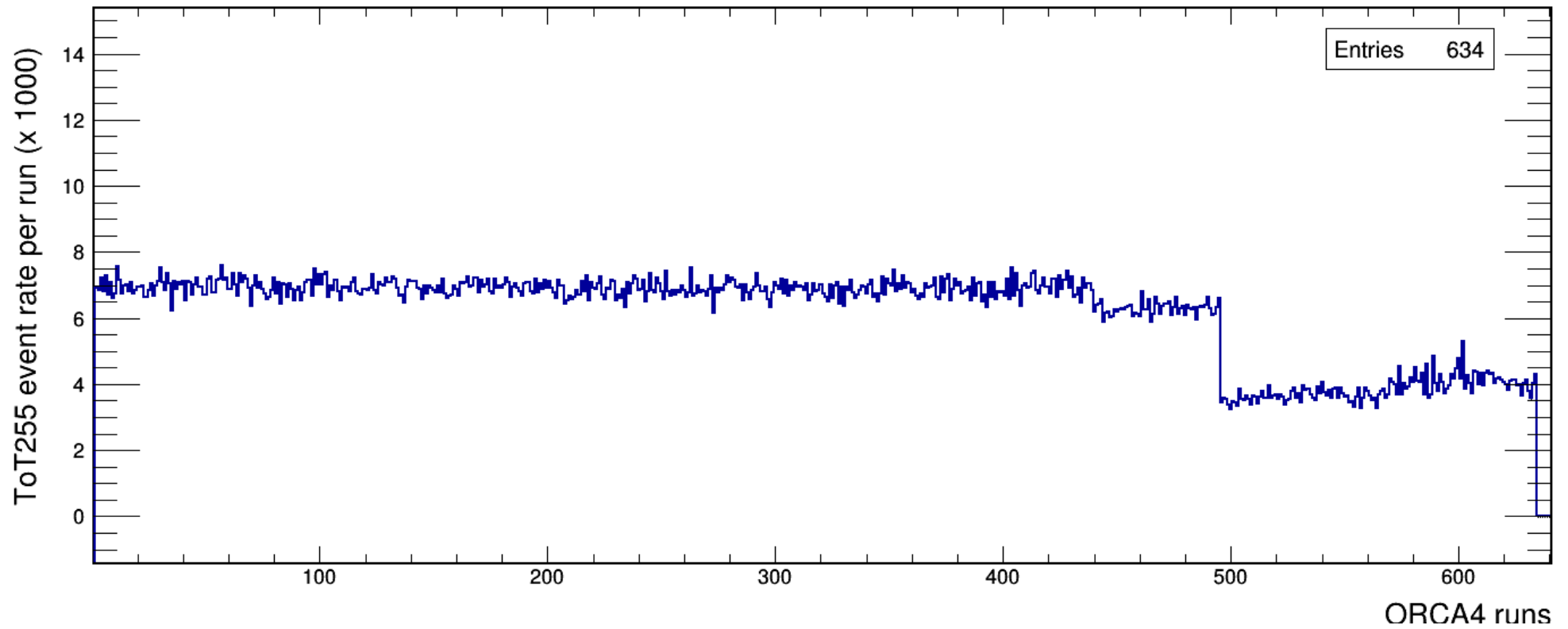
ORCA4 ToT255 Events



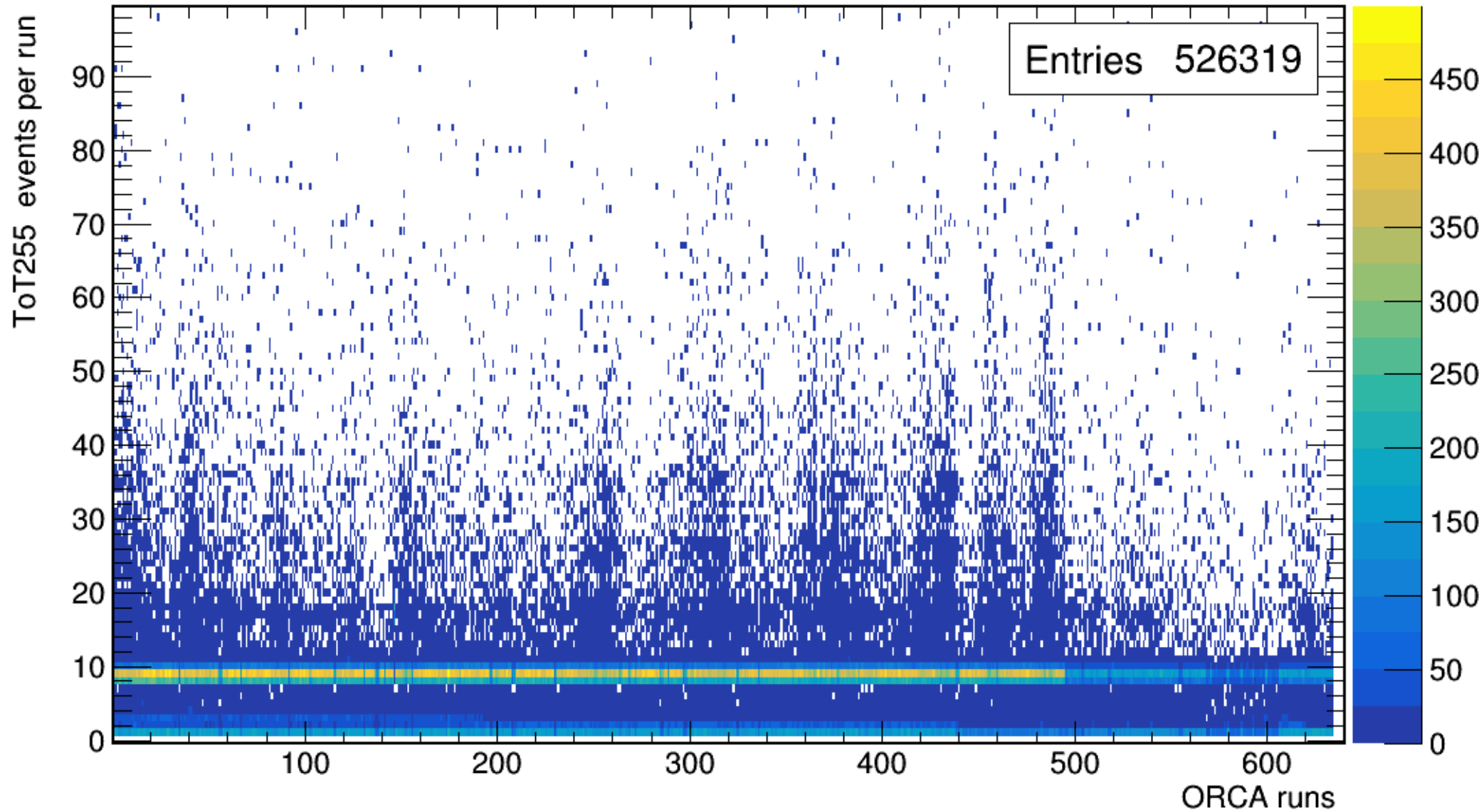
ToT255 Event Rates/Run



ToT255 Event Rates/Run



ToT255 Event Rates/Run



Summary and Outlook

- Rate of ToT255 events in the ORCA data is about 0.7%
- Rate of ToT255 events are significantly lower for the latter runs
- DOM on Line 3 (dom id: 808447180) is a source of large signals
Source of these signal is a PMT # 29
- Further studies of high ToT signals are needed for identifying and better understanding of sparking DOM problem