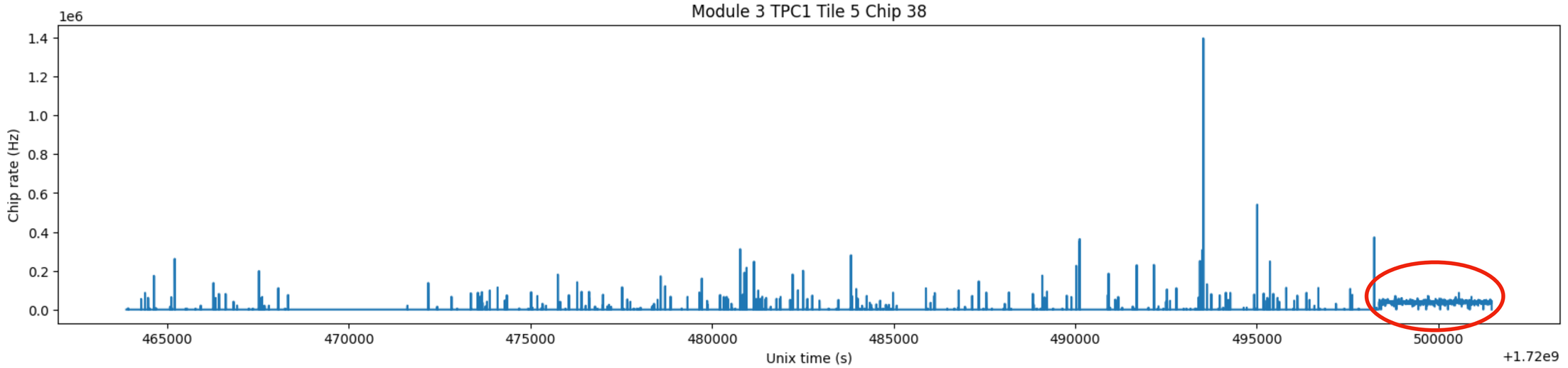
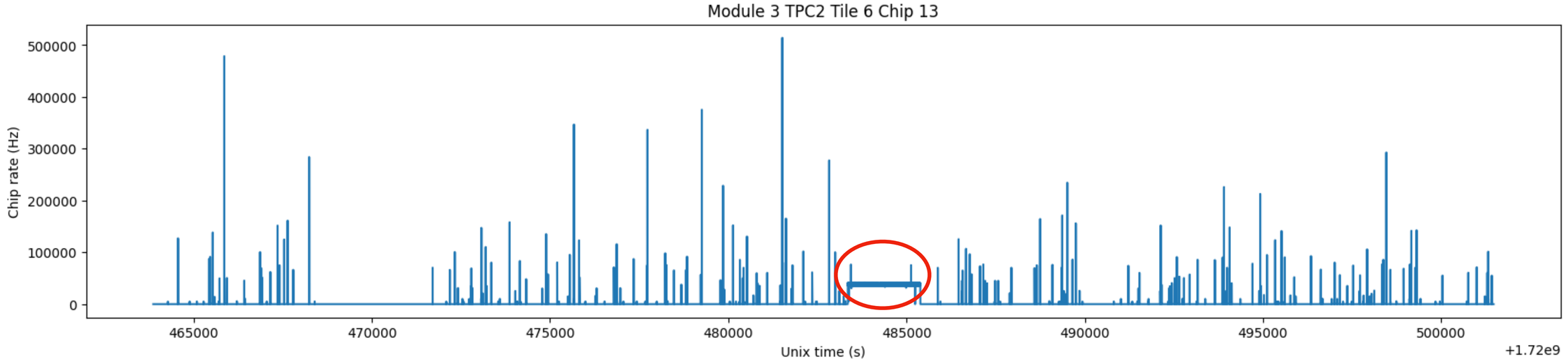
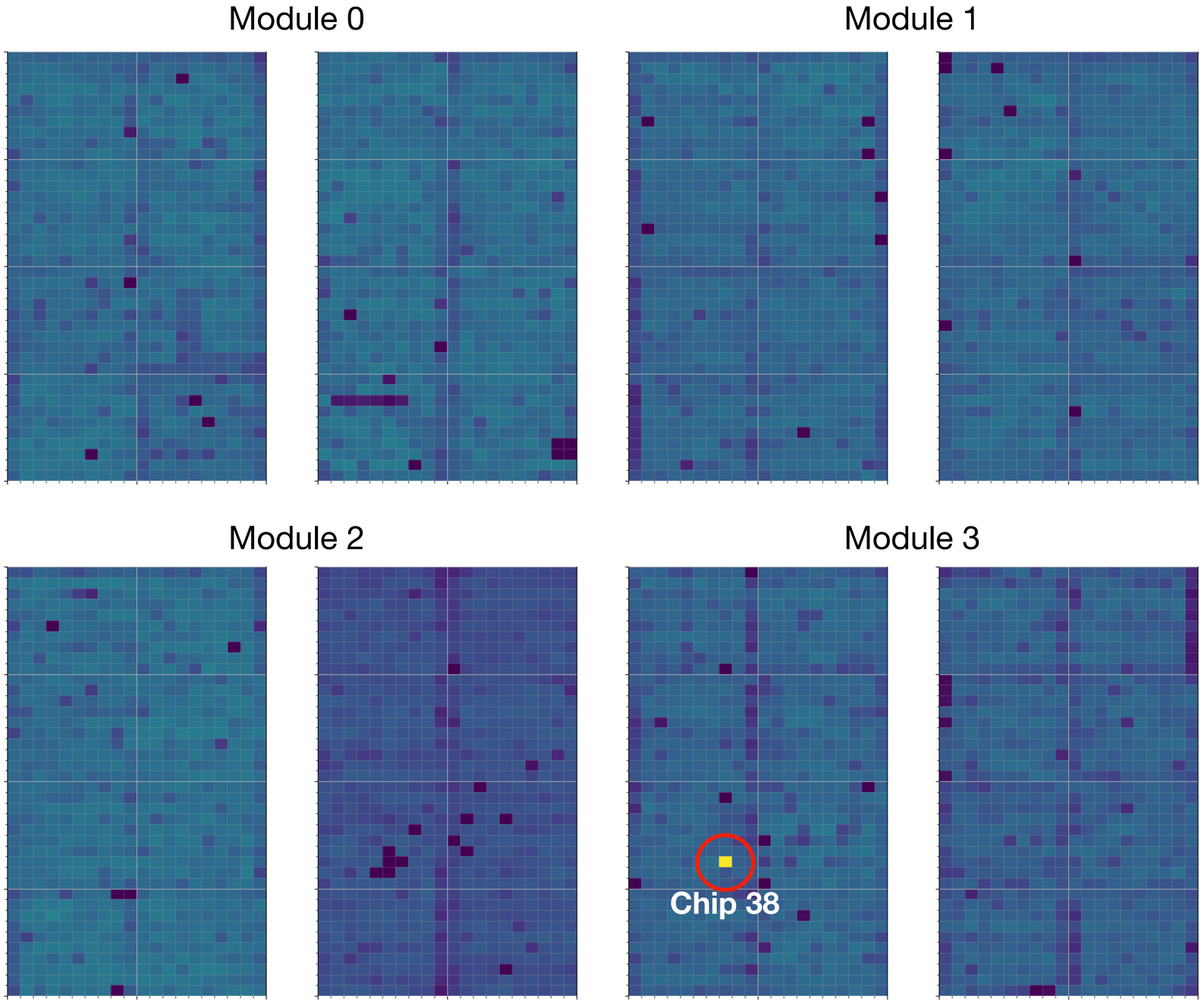
2x2 Hot Channels: July 8-9 Beam-Only

Zhongyi Wu

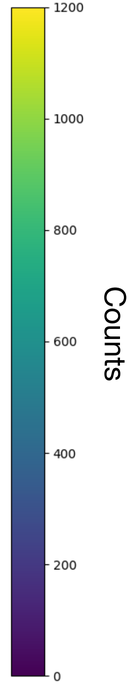
packet-0050015-2024_07_08_13_37_49 to packet-0050017-2024_07_08_23_54_32
(~10.5 hours, ~37800 spills total)







In how many spills a chip being hot during the runtime?

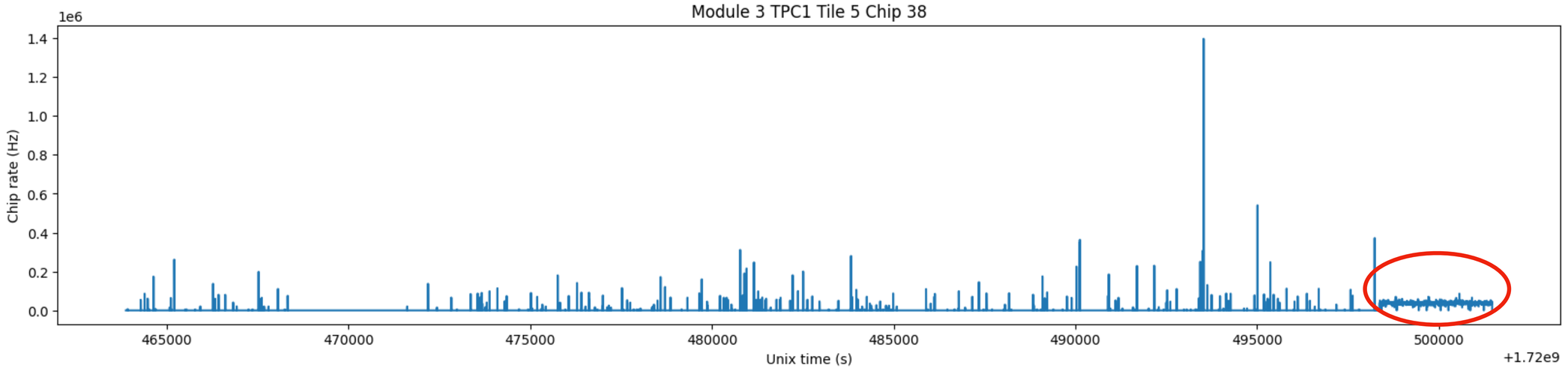


- Module 3 TPC1 Tile 5 Chip 38 (counts = 1196)

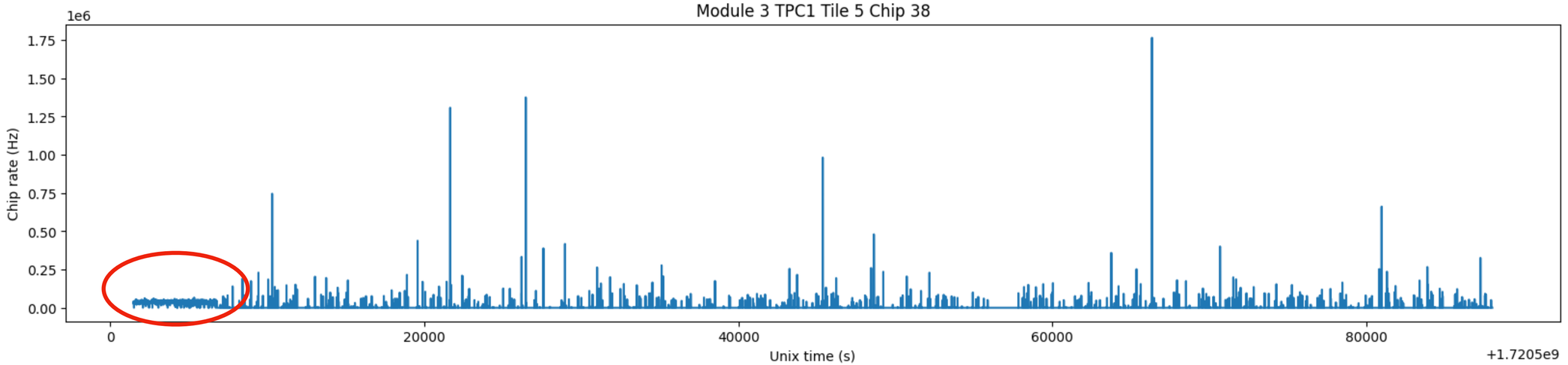
packet-0050017-2024_07_09_00_04_33 to packet-0050017-2024_07_09_23_57_06 (~24 hours)

Module 3 TPC1 Tile 5 Chip 38: Chip Rate Per Spill vs. Unix time

packet-0050015-2024_07_08_13_37_49 to packet-0050017-2024_07_08_23_54_32

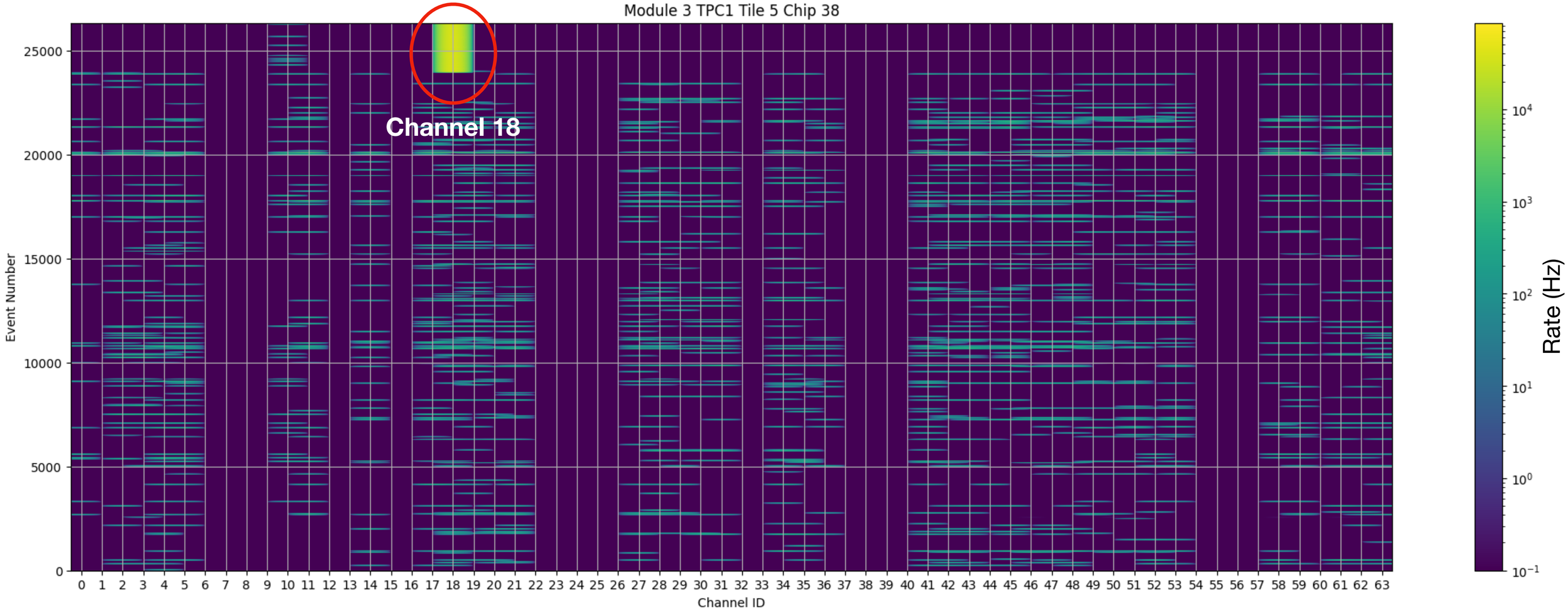


packet-0050017-2024_07_09_00_04_33 to packet-0050017-2024_07_09_23_57_06



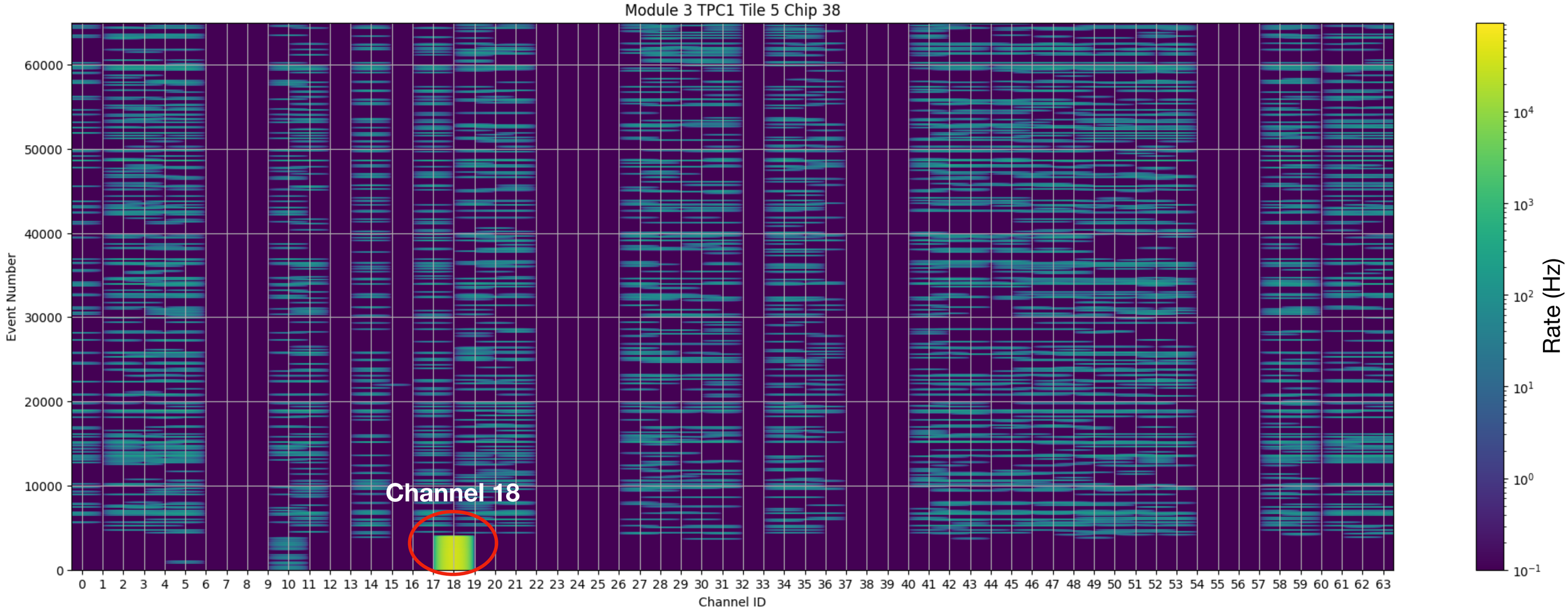
Channel Plot: Module 3 TPC1 Tile 5 Chip 38

packet-0050015-2024_07_08_13_37_49 to packet-0050017-2024_07_08_23_54_32



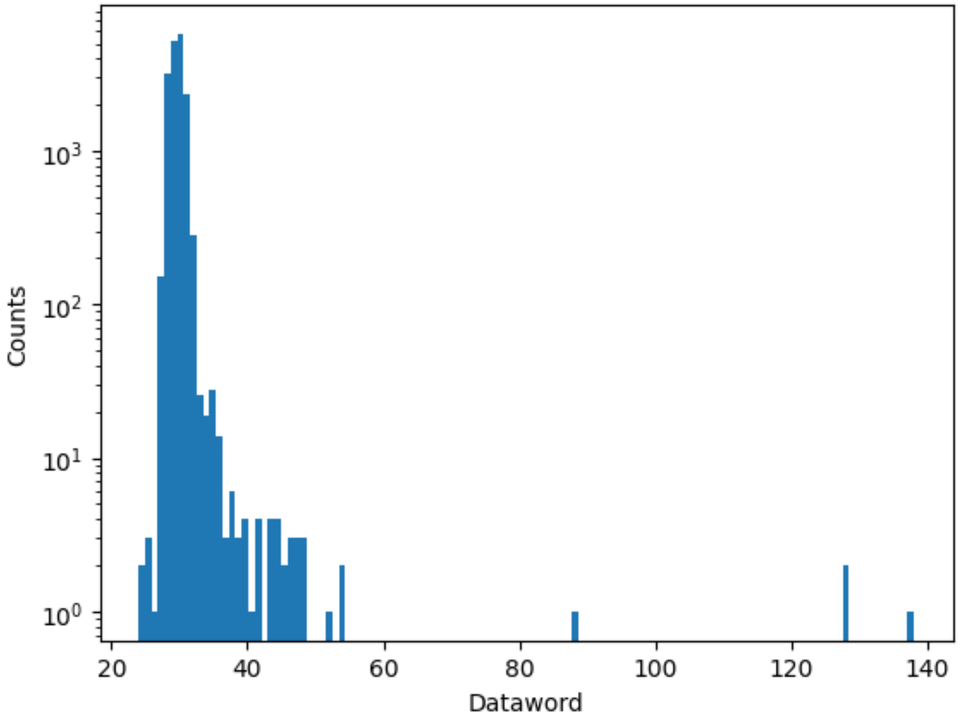
Channel Plot: Module 3 TPC1 Tile 5 Chip 38

packet-0050017-2024_07_09_00_04_33 to packet-0050017-2024_07_09_23_57_06

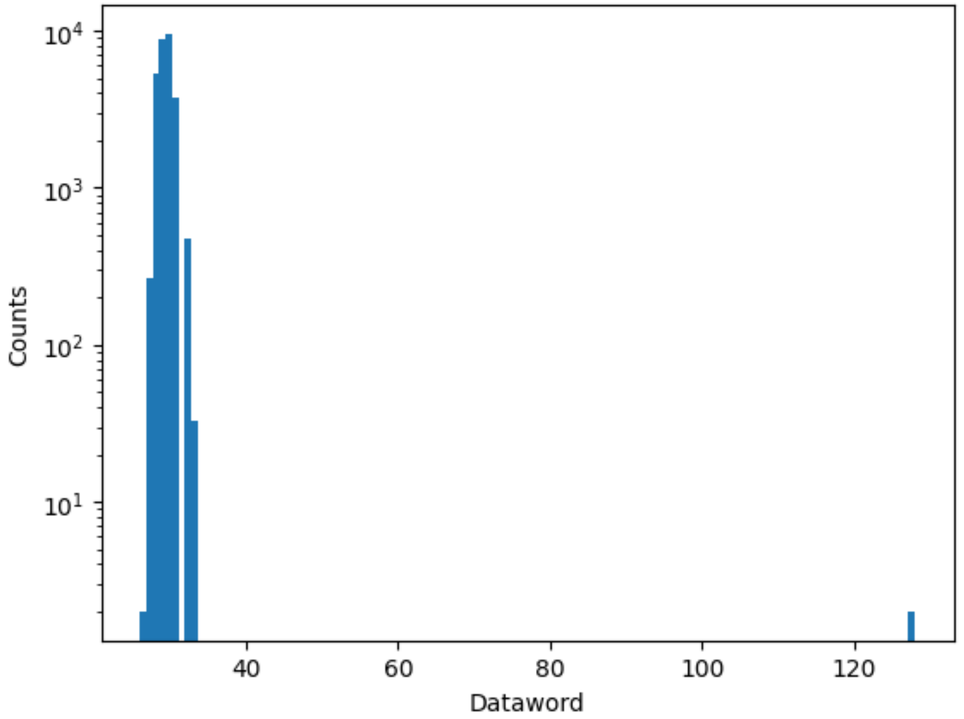


Dataword Distribution: Module 3 TPC1 Tile 5 Chip 38 Channel 18

packet-0050015-2024_07_08_13_37_49
to
packet-0050017-2024_07_08_23_54_32



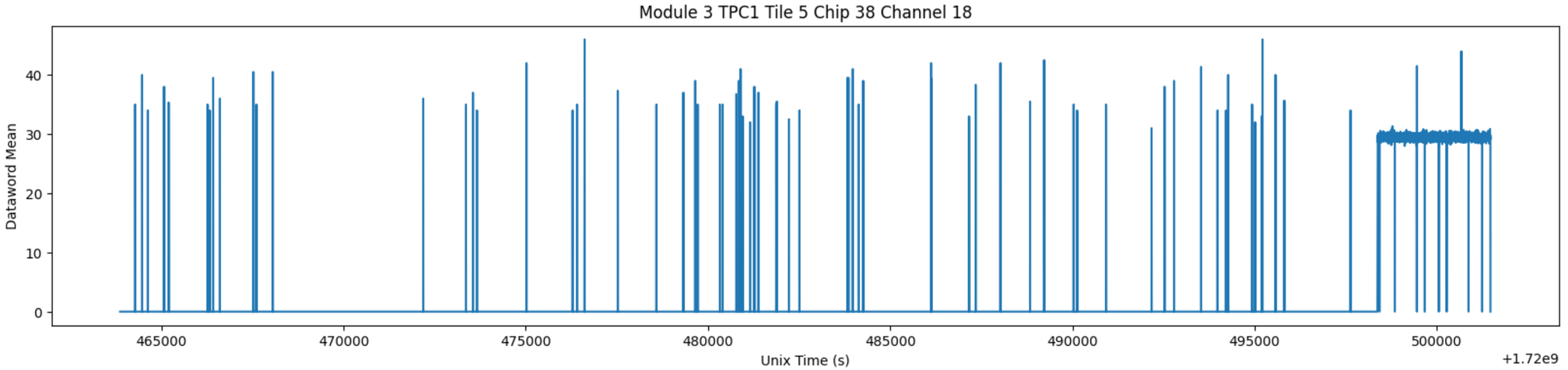
packet-0050017-2024_07_09_00_04_33
to
packet-0050017-2024_07_09_23_57_06



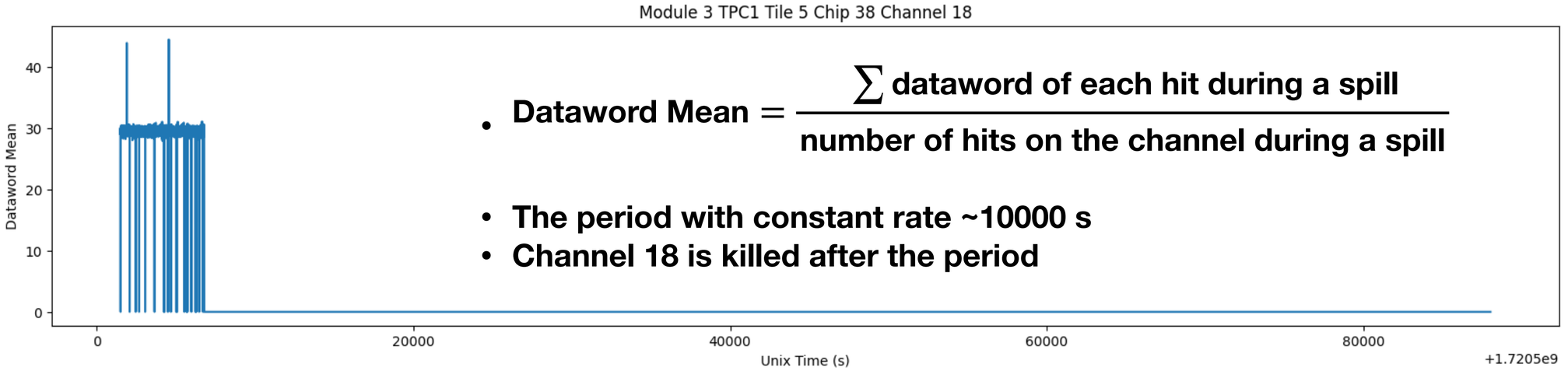
Most hits on channel 18 have ADC dataword of ~30

Dataword Mean: Module 3 TPC1 Tile 5 Chip 38 Channel 18

packet-0050015-2024_07_08_13_37_49 to packet-0050017-2024_07_08_23_54_32



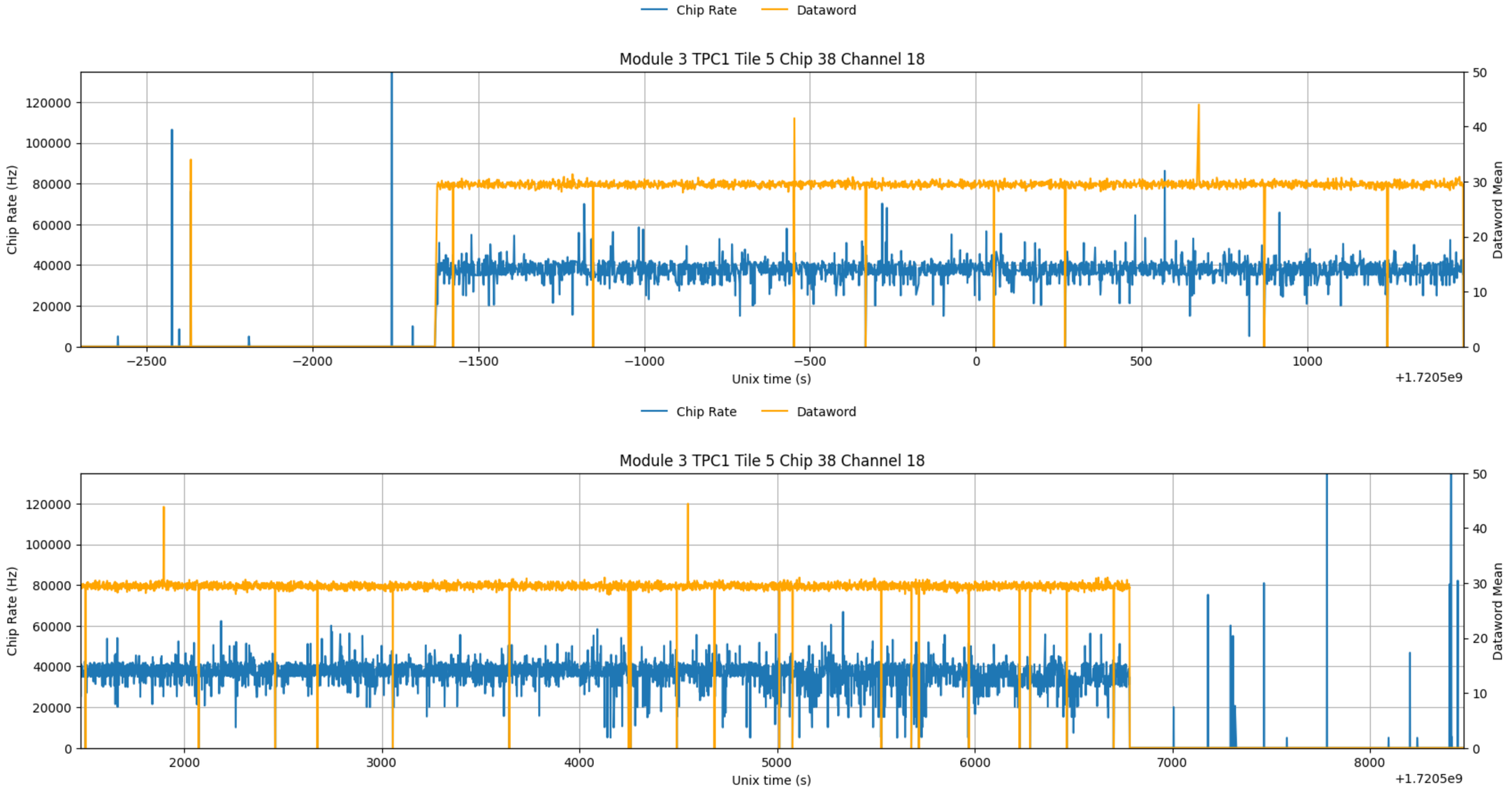
packet-0050017-2024_07_09_00_04_33 to packet-0050017-2024_07_09_23_57_06



- **Dataword Mean** $= \dfrac{\sum \text{dataword of each hit during a spill}}{\text{number of hits on the channel during a spill}}$

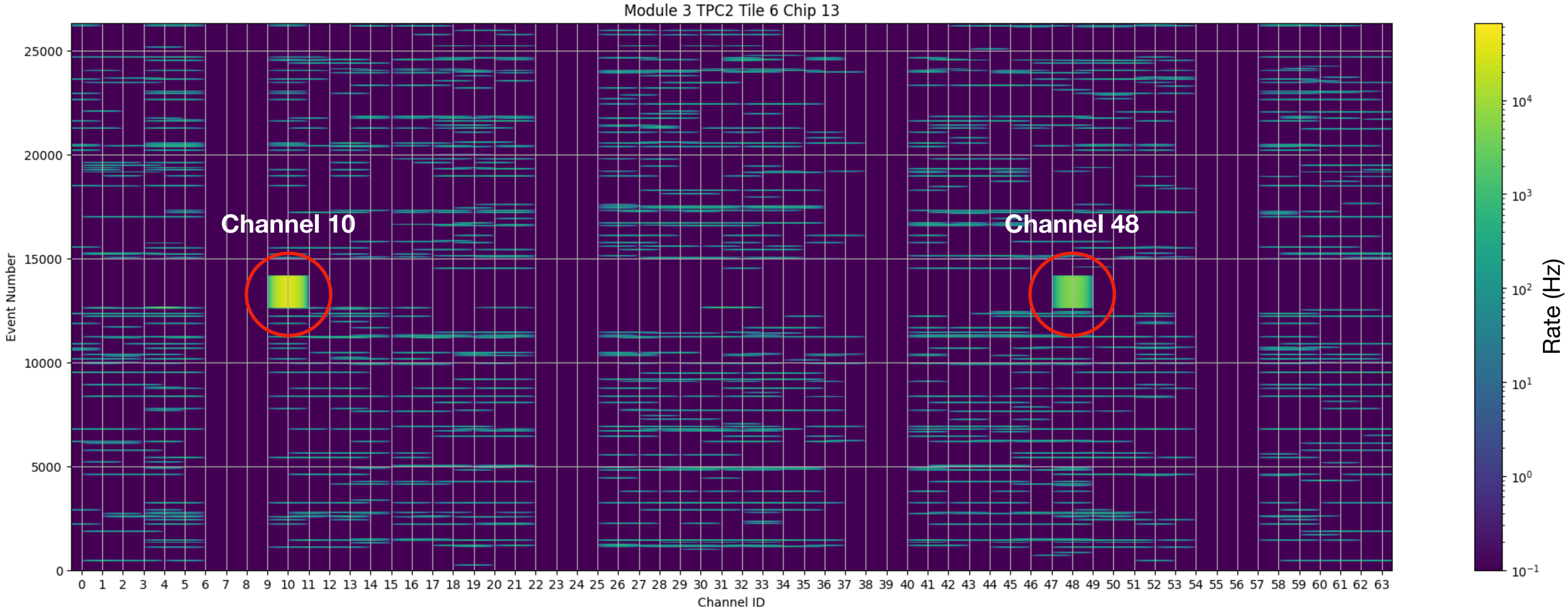
- **The period with constant rate ~10000 s**
- **Channel 18 is killed after the period**

Dataword Mean: Module 3 TPC1 Tile 5 Chip 38 Channel 18



Channel Plot: Module 3 TPC2 Tile 6 Chip 13

packet-0050015-2024_07_08_13_37_49 to packet-0050017-2024_07_08_23_54_32

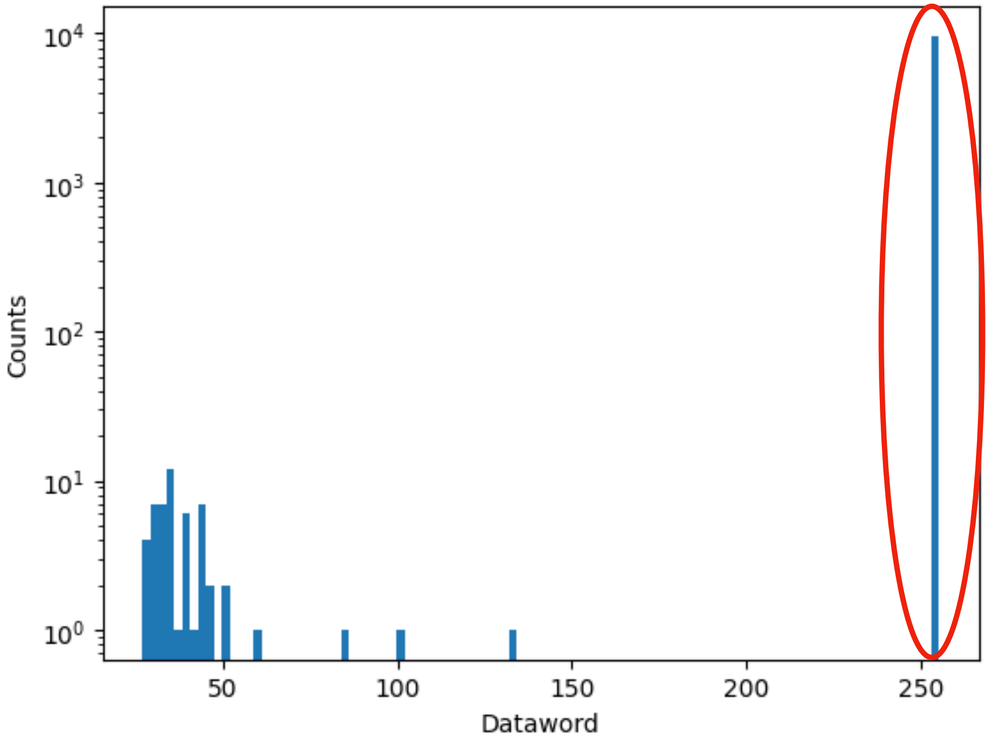


Most channels seem to shut down when some channels are constantly firing

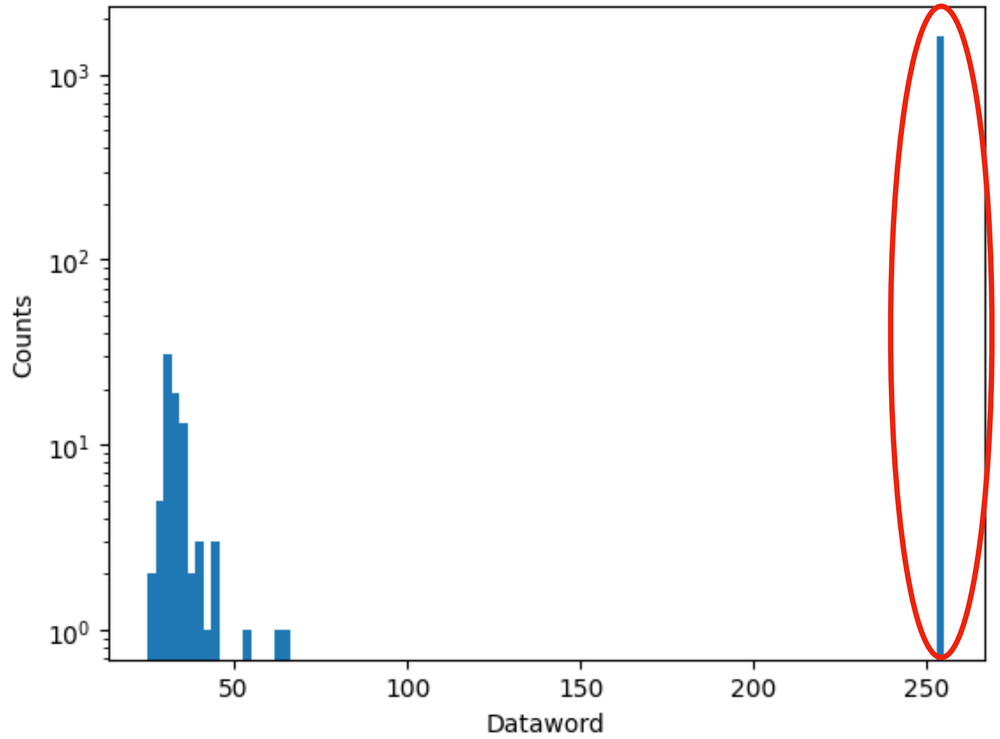
Dataword Distribution

packet-0050015-2024_07_08_13_37_49 to packet-0050017-2024_07_08_23_54_32

Module 3 TPC2 Tile 6 Chip 13
Channel 10



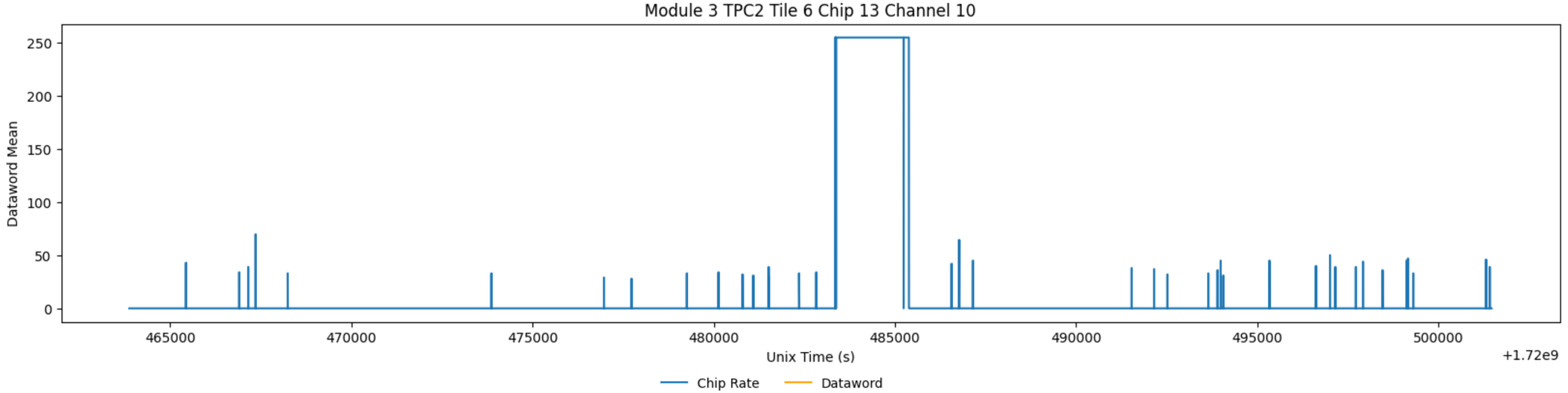
Module 3 TPC2 Tile 6 Chip 13
Channel 48

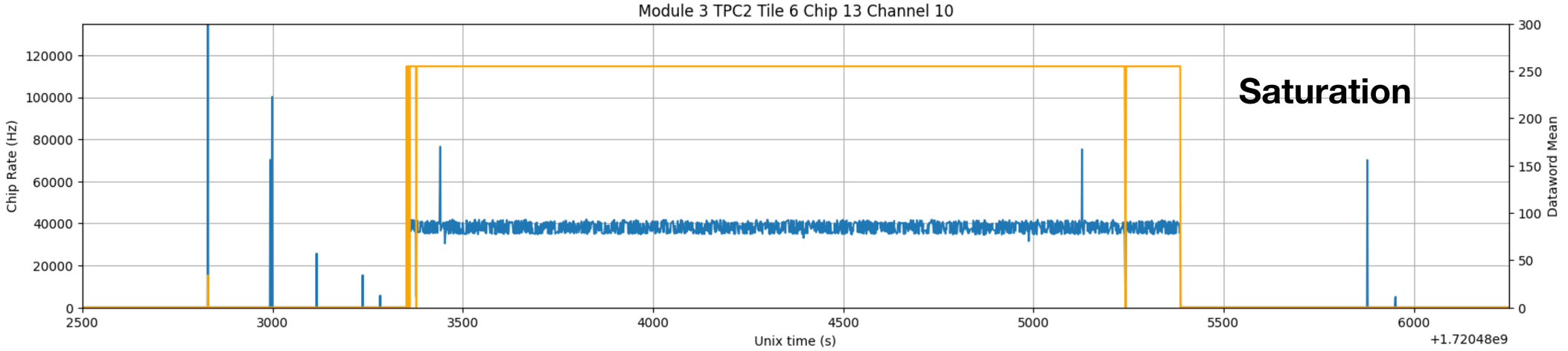


Most hits on channel 10 & 48 have ADC dataword of 255 (saturation)

Dataword Mean: Module 3 TPC2 Tile 6 Chip 13 Channel 10

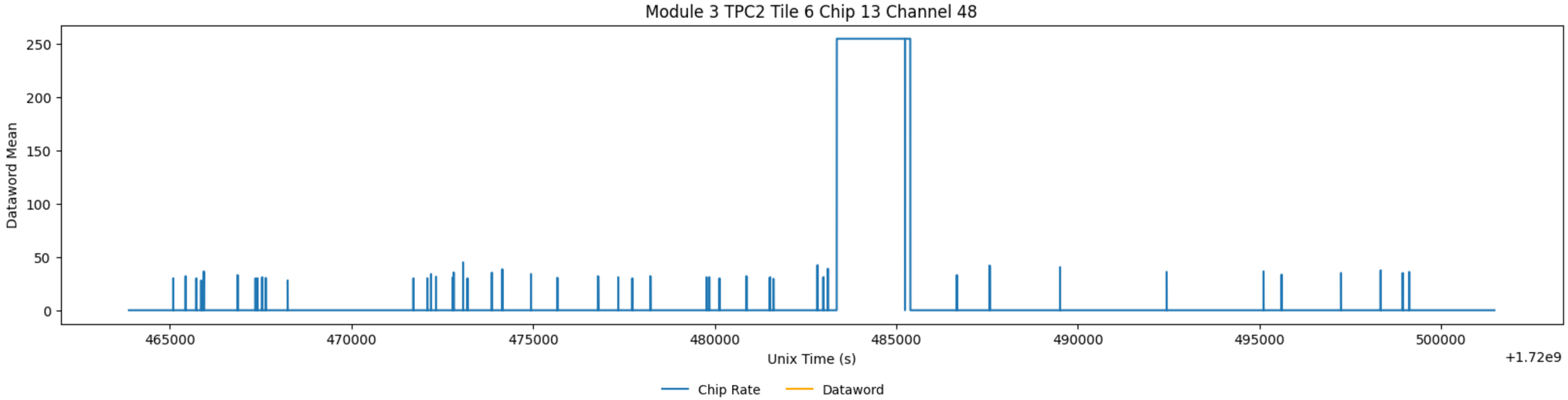
packet-0050015-2024_07_08_13_37_49 to packet-0050017-2024_07_08_23_54_32

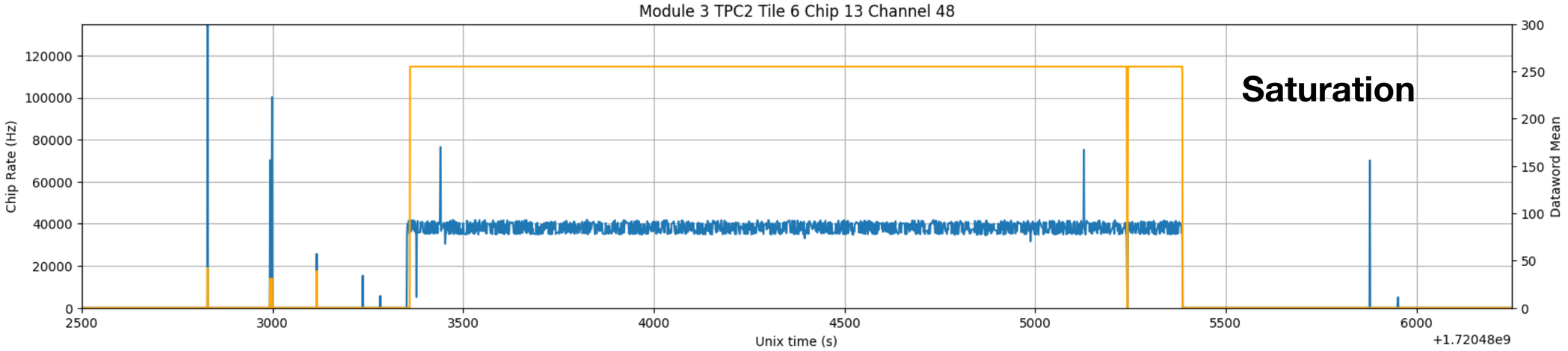




Dataword Mean: Module 3 TPC2 Tile 6 Chip 13 Channel 48

packet-0050015-2024_07_08_13_37_49 to packet-0050017-2024_07_08_23_54_32





Conclusions

- **Module 3 TPC1 Tile 5 Chip 38 Channel 18**
  - ADC dataword mean ~30 during the constant chip rate period, need to check the threshold.
  - Killed after this period.
- **Module 3 TPC2 Tile 6 Chip 13 Channel 10 & 48**
  - ADC dataword mean is 255 at the saturation point during the constant chip rate period.
  - Back to normal after this period.
- Most channels seem to shut down during the period when one or more channels are constantly firing and resume after the the hot channels stop firing.
- Need to look at ASIC configurations for the constant chip rate periods.