PASTA Data Analysis Status

MUST Kickoff Meeting Discussion

June 15, 2026

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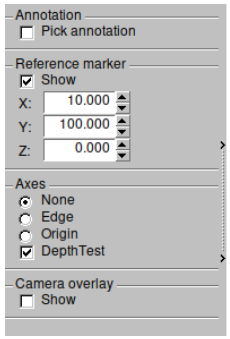
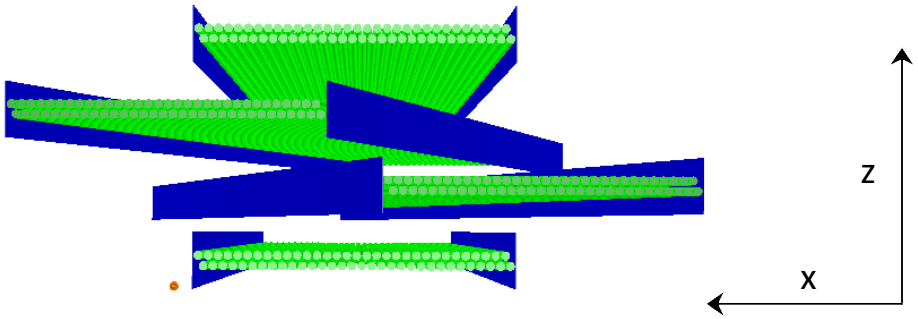
Topics

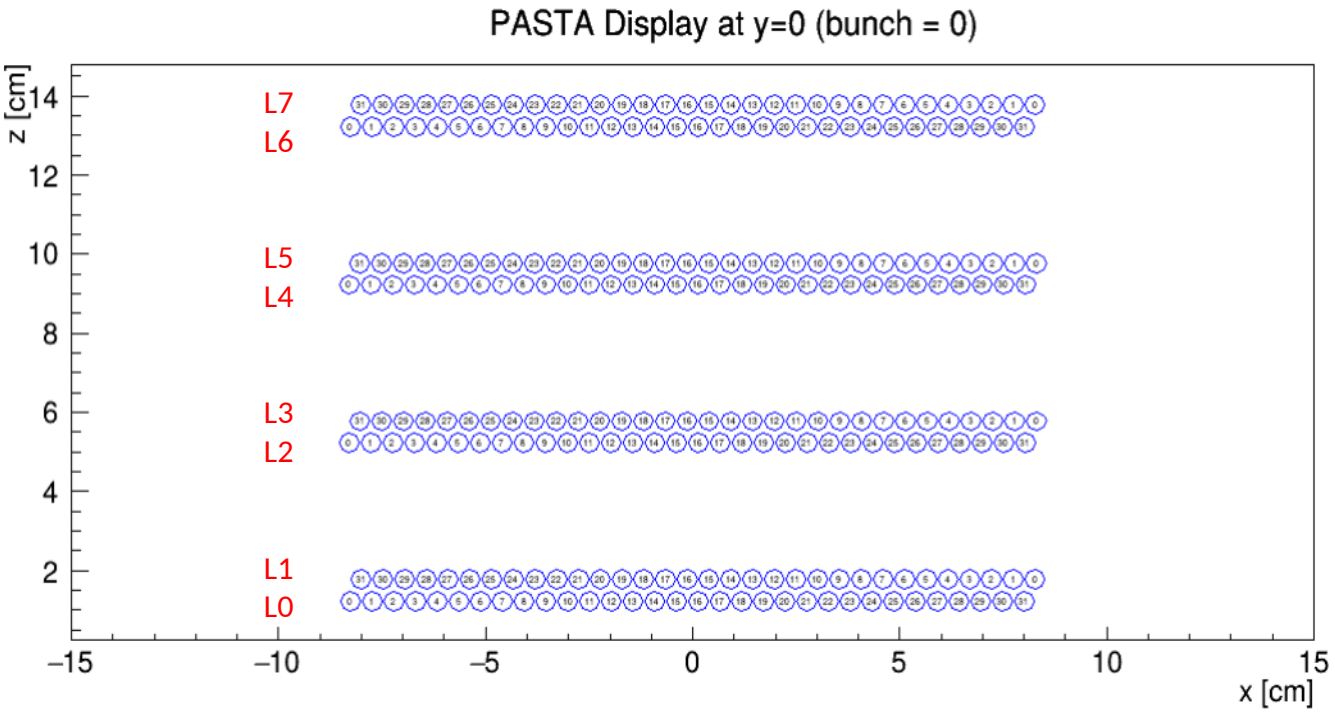
- Simplified event display
- Time correlations and correction
- Bunch detection
- Hit Patterns for tracklets

PASTA Geometry Layout

- Detector layout (from must_v25c_mcbm.geo)

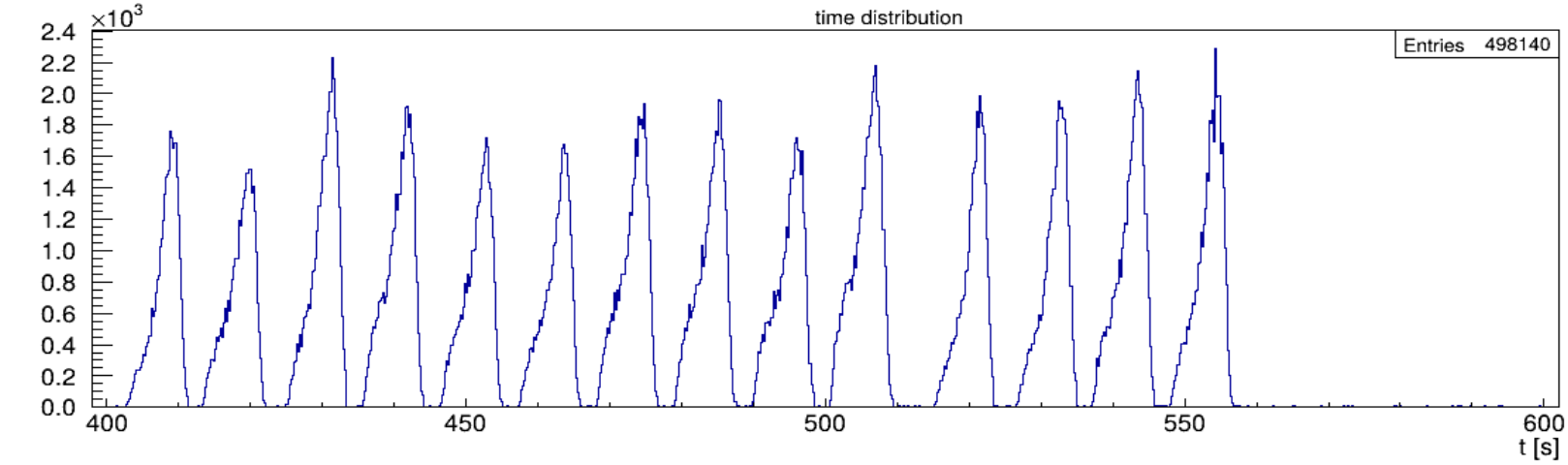


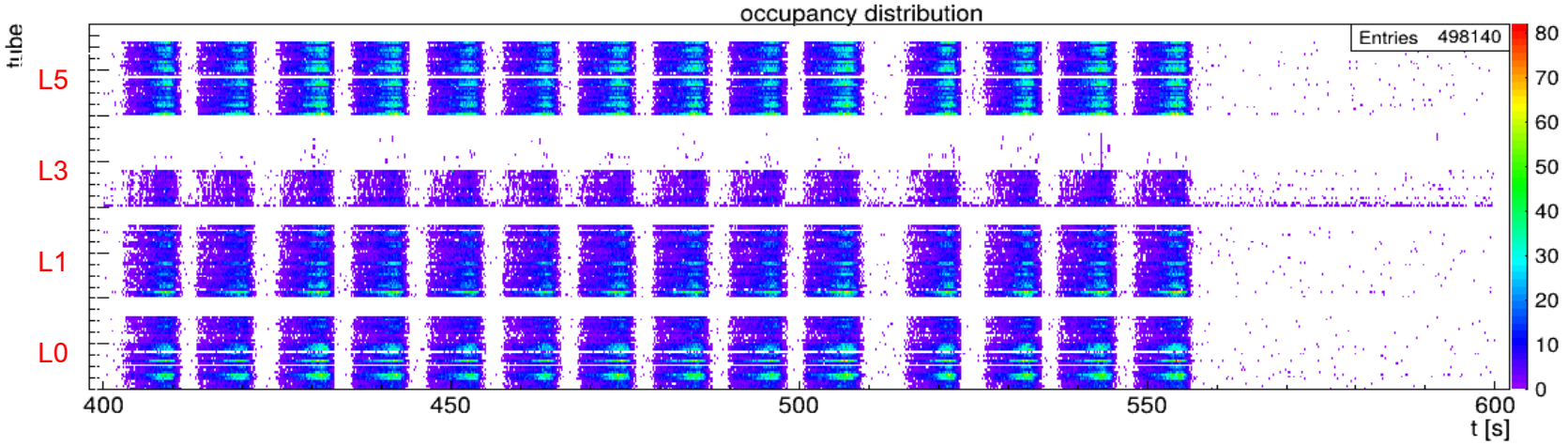




Spill/Time Structure Run 3489

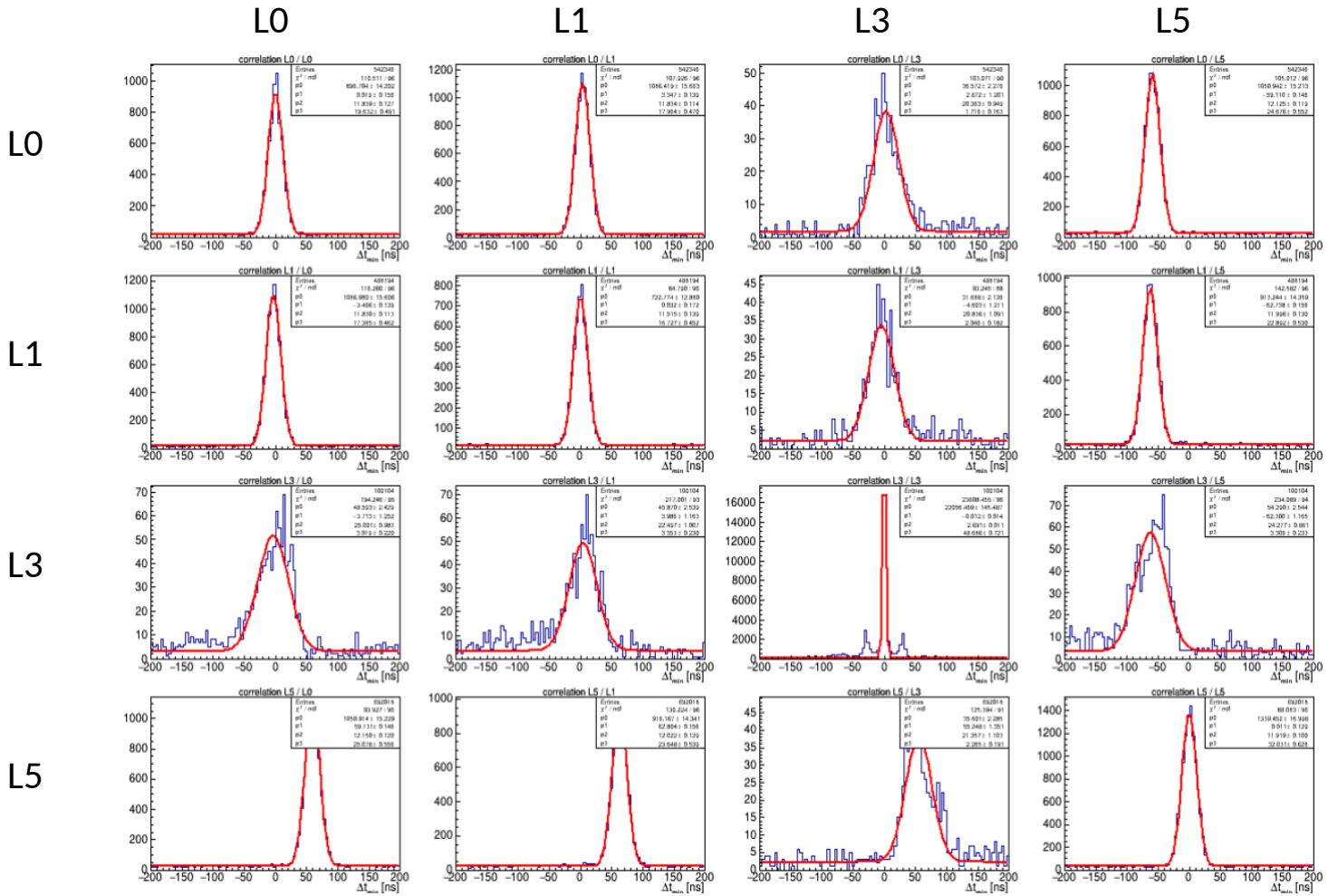
- Example for spill/time structure for Feb 25 data
- DAQ from 4 layers only (0,1,3,5)





Time Correlation (Run 3489)

- Study time correlations of layers
  → remove bias seen in correlation to find bunches of hits



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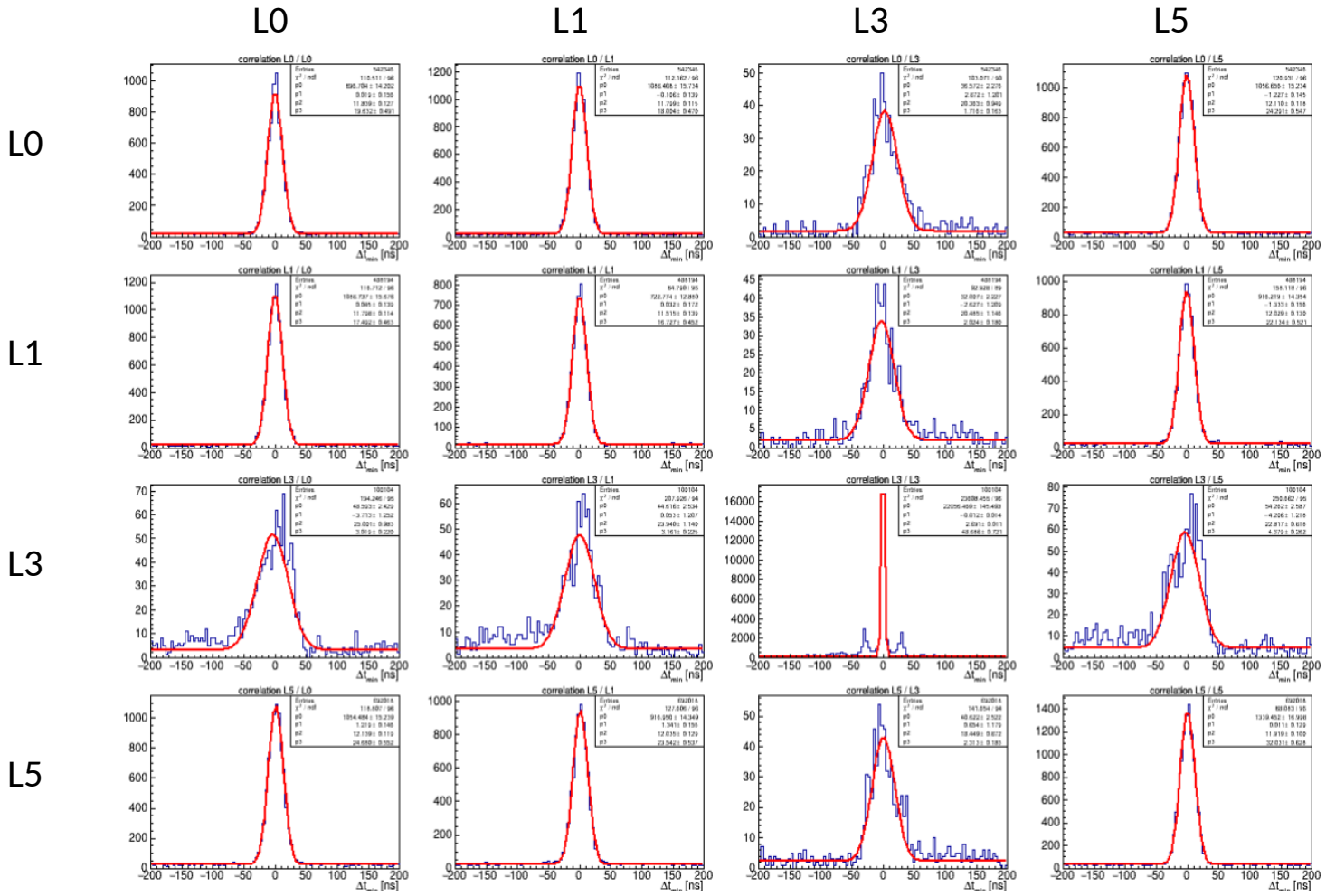
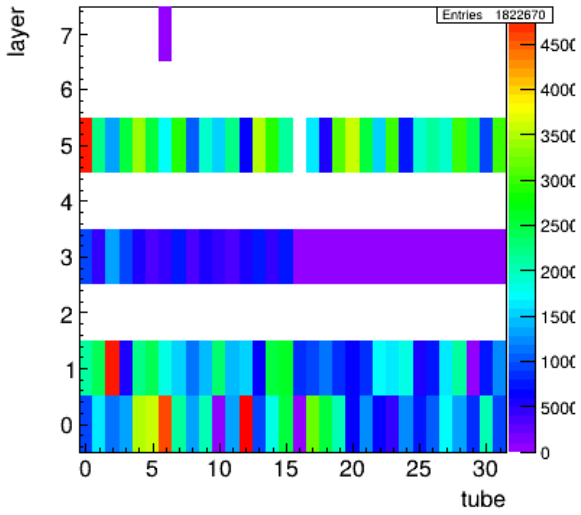
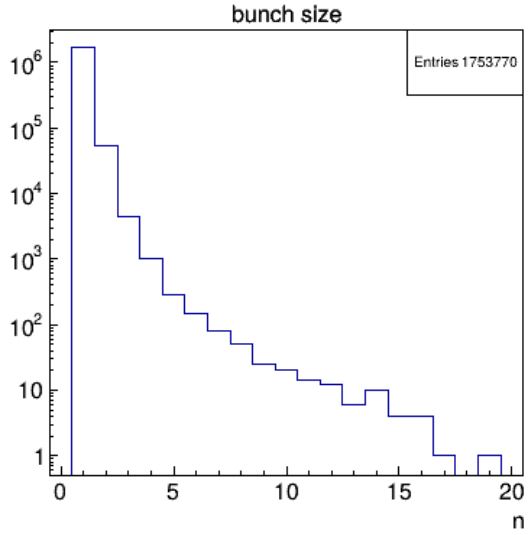
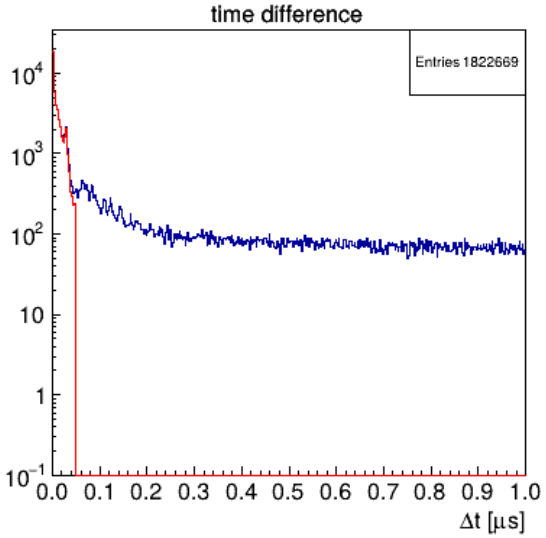


Time Bunch Identification (Run 3489)

- Idea:
  - Sort digi times
  - Loop all digi times
    - Find all digis within a given time window, e.g. 50 ns (→ bunch)
    - If bunch fulfils certain criteria, count & investigate pattern

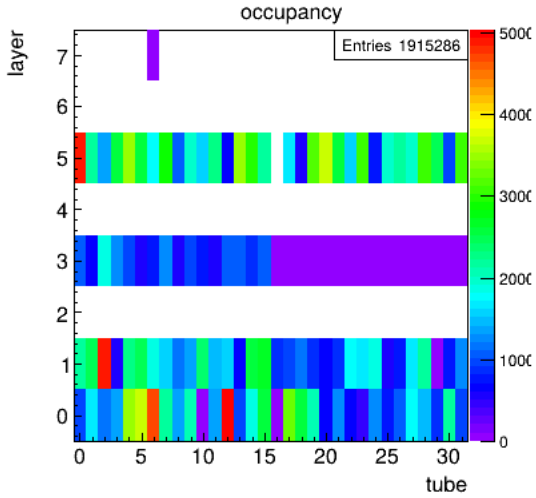


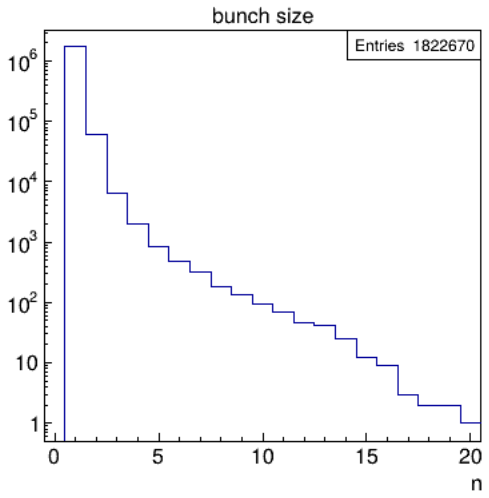


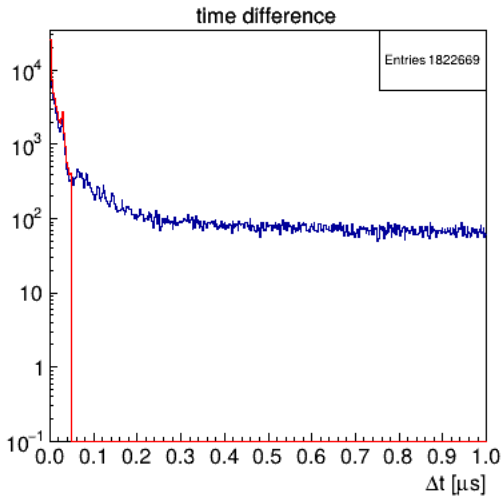


Time Bunch Identification (Run 3489)

- Criteria: none

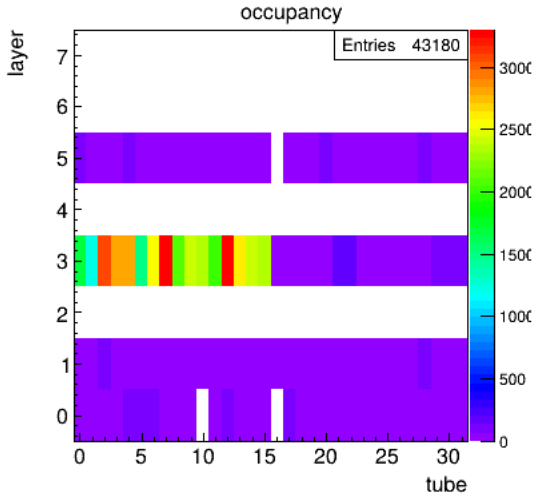


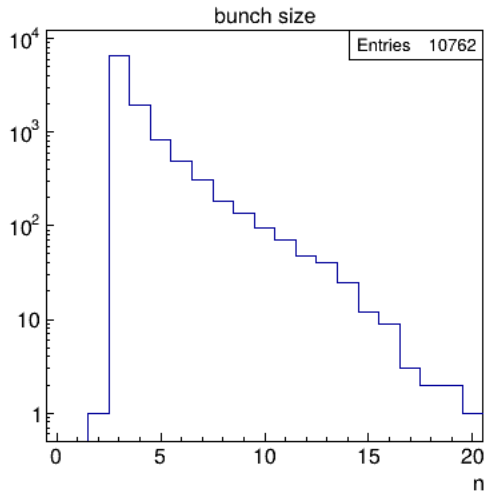


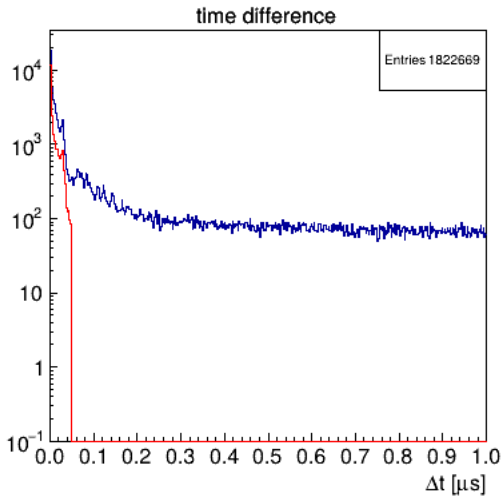


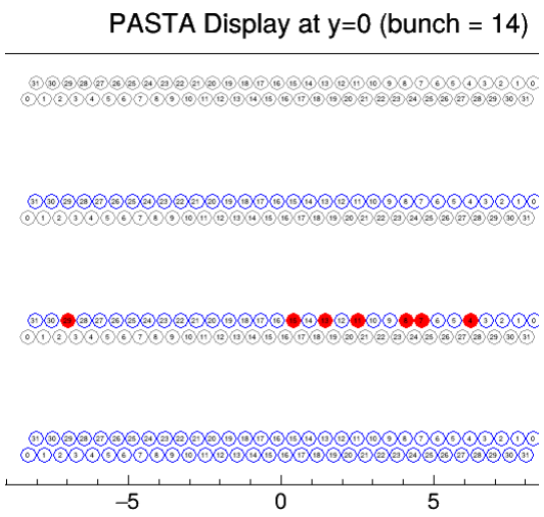
Time Bunch Identification (Run 3489)

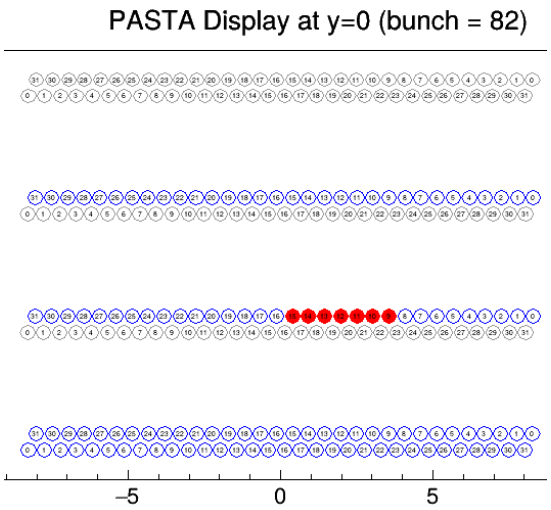
- Criteria: t_{win} = 50ns, n_{digi} = 3 → n_{bunch} = 10762





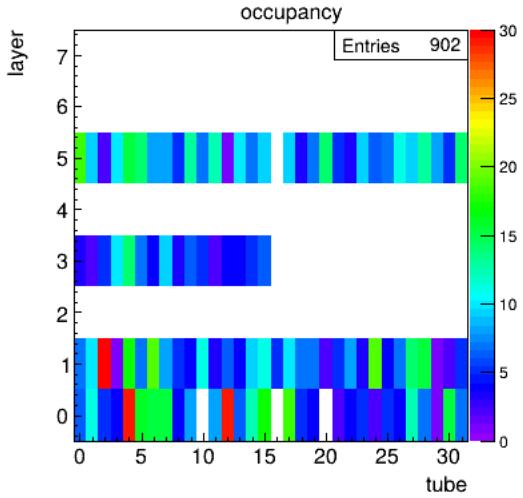


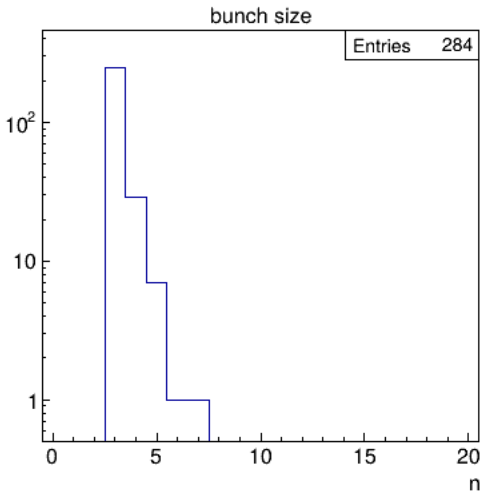


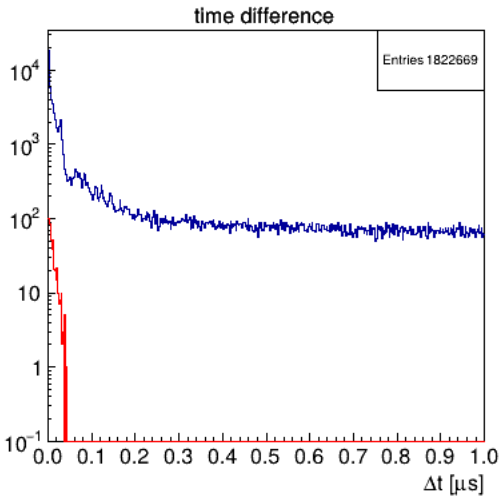


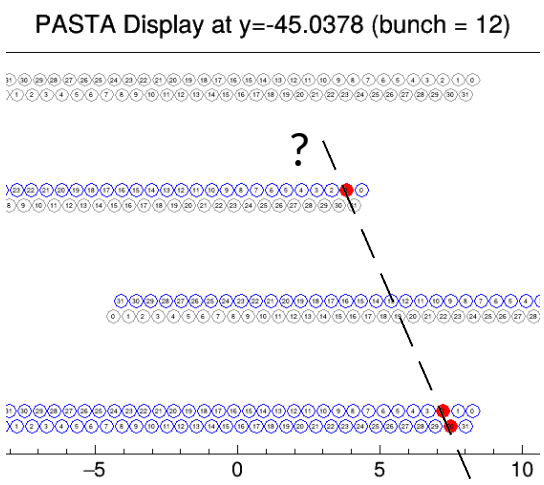
Time Bunch Identification (Run 3489)

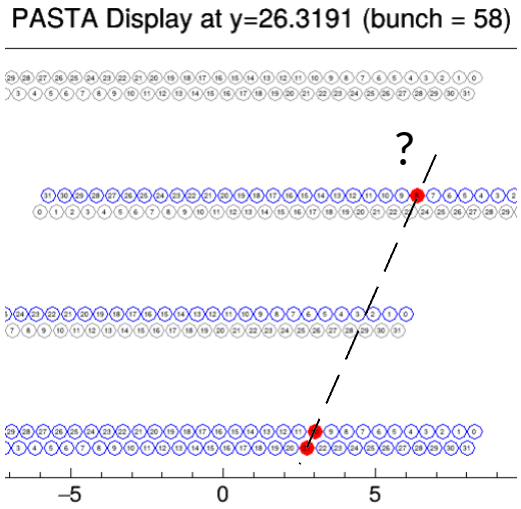
- Criteria: t_{win} = 50ns, n_{layer} = 3 → n_{bunch} = 284

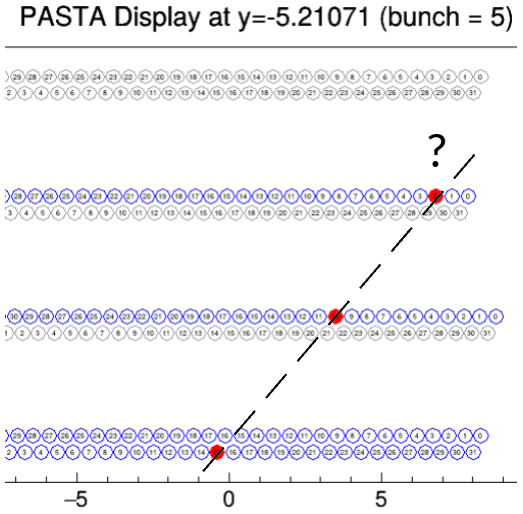






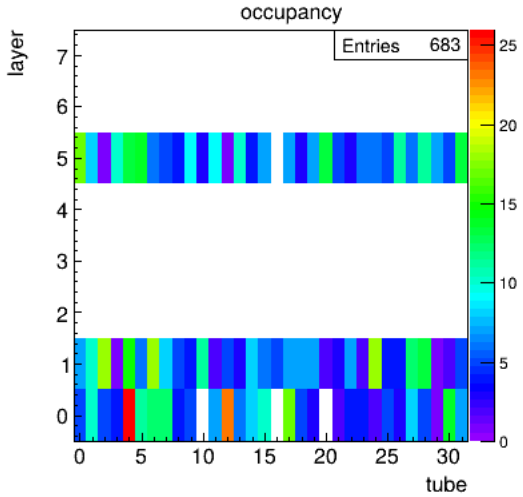


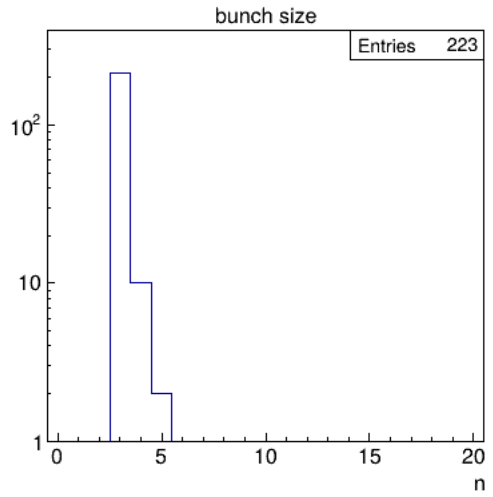


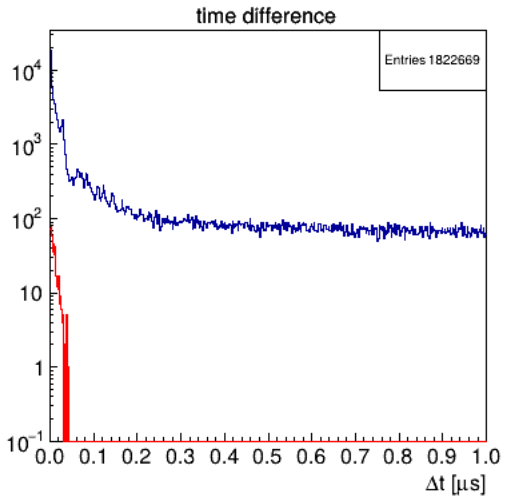


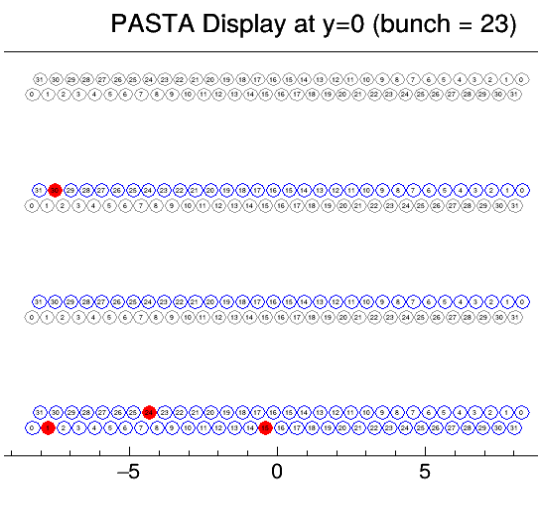
Time Bunch Identification (Run 3489)

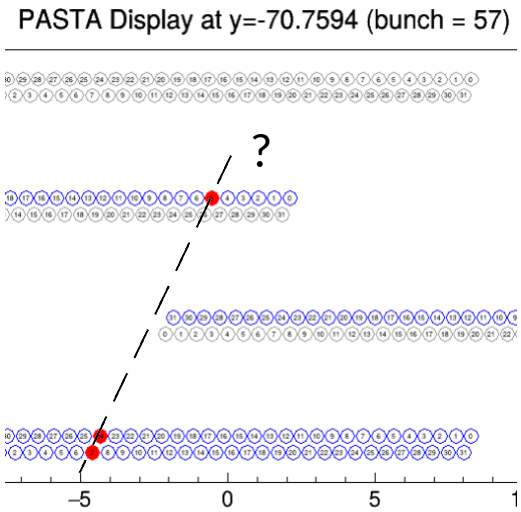
- Criteria: t_{win} = 50ns, hit = L0, L1, L5 → n_{bunch} = 223

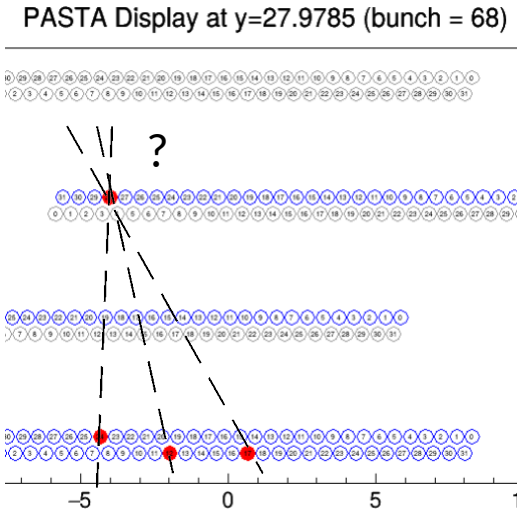






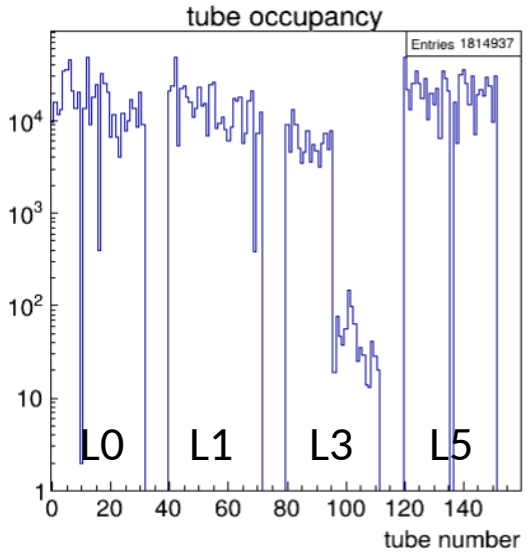


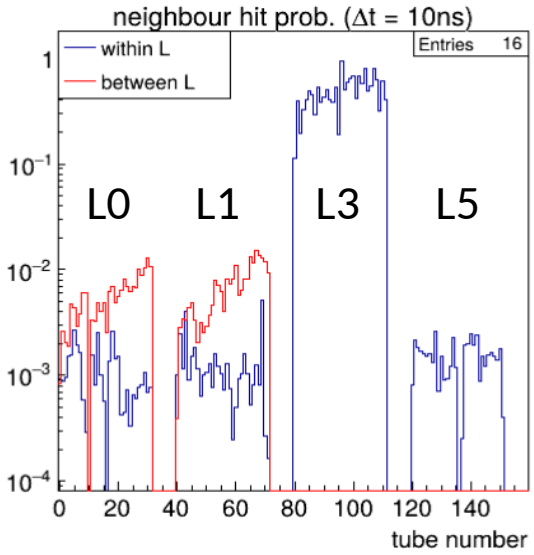


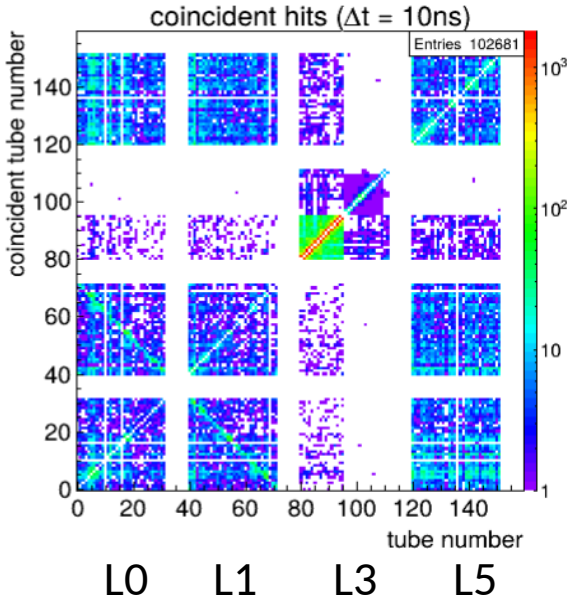


Coincident Hits

- (Electronic) noise / cross talk analysis
- Coincident hits in neighbouring straws/layers within time window







Summary / Outlook

- Studied time/geom. correlation
  → Hint for tracklets
  → What about efficiency?
  → Detector tuning and more data taking needed?

Next Steps

- Study time/geometrical correlation with ToF or STS
- Run PASTA simulation