Status Report

Ryotaro Tsuchii

CIDeR-ML collaboration meeting

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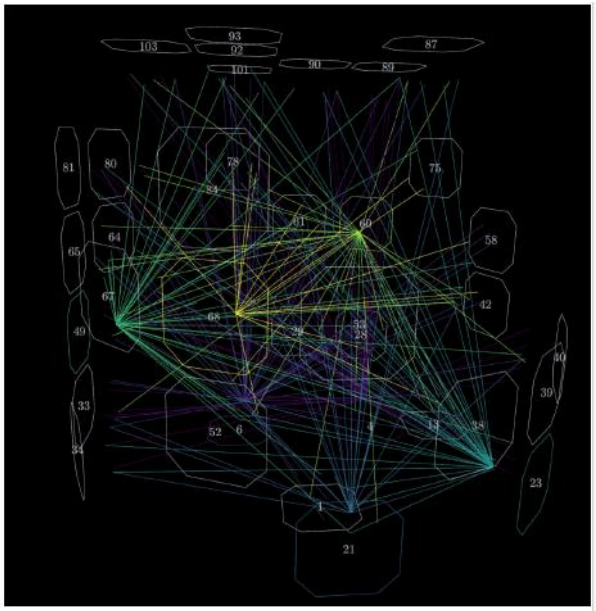
4-month plan

- Goal: Adjust the WCTE calibration data in order to test the Siren calibration framework.
- I have decided to proceed with calibration using LED data.
- The timing calibration using LED data is currently being done by other WCTE collaborators, but the charge calibration is not actively worked.
  → The LED data can not be processed into a format Siren can use immediately now.
- Next steps:
  1. Do 1 p.e. gain calibration in the standard WCTE context (a somewhat simplified approach is acceptable).
  2. Convert to a format usable by Siren.

LED data

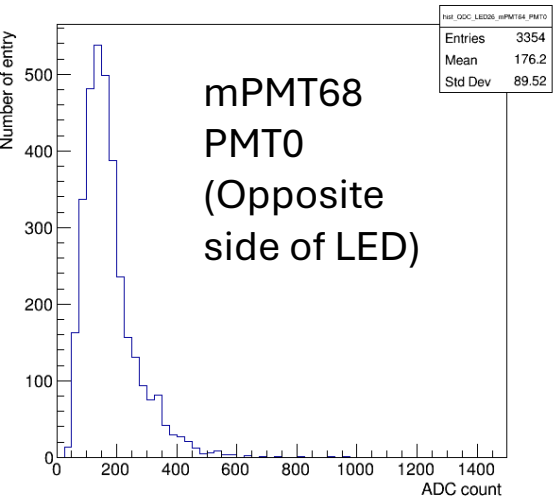
- Three LEDs in each mPMT.
  - Wave length: 365 nm, 405 nm, 470 nm
- There are 2 types of mPMTs:
  - Ex-situ: two 15° collimators, one diffuse
  - In-situ: two 30° collimators, one diffuse
- Calibrate:
  - PMT relative timing
  - 1 p.e. gain, charge distribution (me)

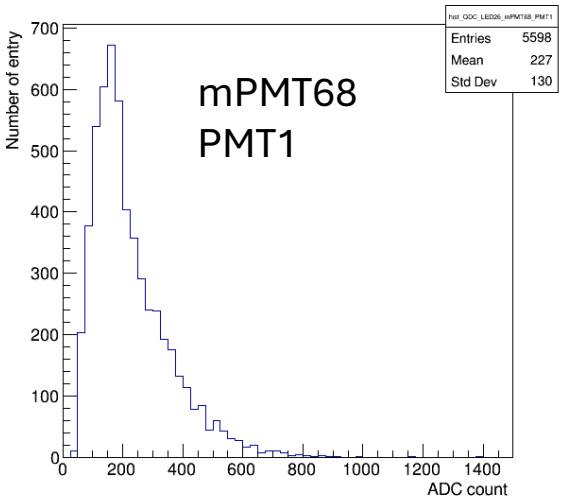


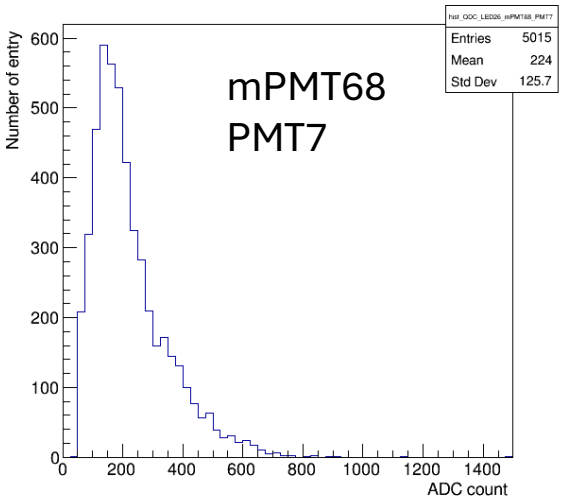
PMT amplitude

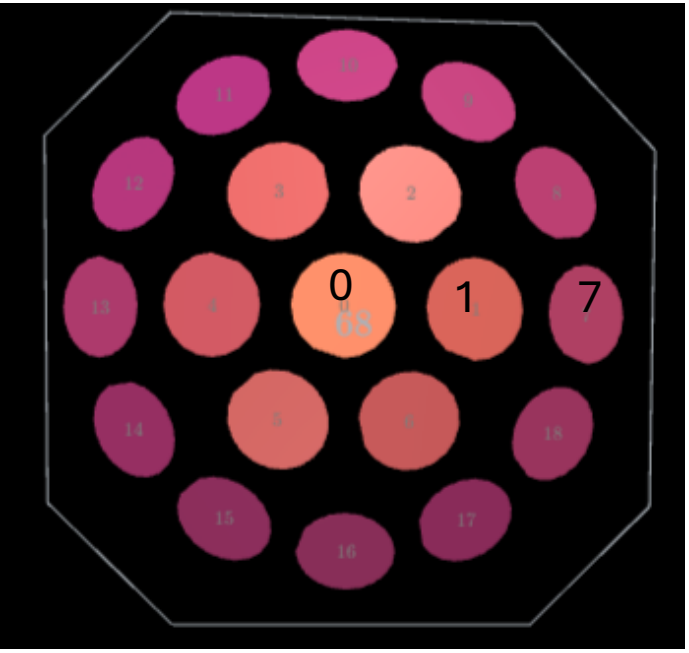
- LEDs fire at ~2 kHz.
- Other mPMTs measure the signals from one LED.
  - Most data: self-trigger
  - Some data: software trigger

LED data









- I checked the TTree structure and tried to plotted the QDC distribution for each PMT when a LED flash in Run 2231 (self trigger, 5 min).
- LED (flash 9060 times in this run):
  - card id: 26
  - Diffuser
  - 470 nm
  - Position id: 2
- LEDs have position IDs (0, 1, 2, 3 or 4), but I don't know what position each one refers to.
  - I found a file (wcte_bldg157.geo in WCTE git) that seems to contain LED geometry information, but it's binary and I haven't looked at it yet.

LED data

- ToDo:
  - Look up the coordinates of the LED or ask someone.
  - Jakob has prepared the LED p.e. per flash data, so look for it.
  - Estimate the relative number of p.e. received by each PMT when a single LED flashes once (using a method such as simple integration).