Converting the PMT Container Testing Raw Data to ROOT File Format

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Outline

motivation

1. The Raw data of PMT testing is significant for the evaluation of PMT performance.
2. **While,Currently, the raw data of container system is not well organized and it is not convinent for people to get a quikly access.**
3. It is useful to convert all the testing raw data to ROOT format.
   - decrease the file size
   - easy to analysis and manage.
   - shadow the hardware details.

requirements

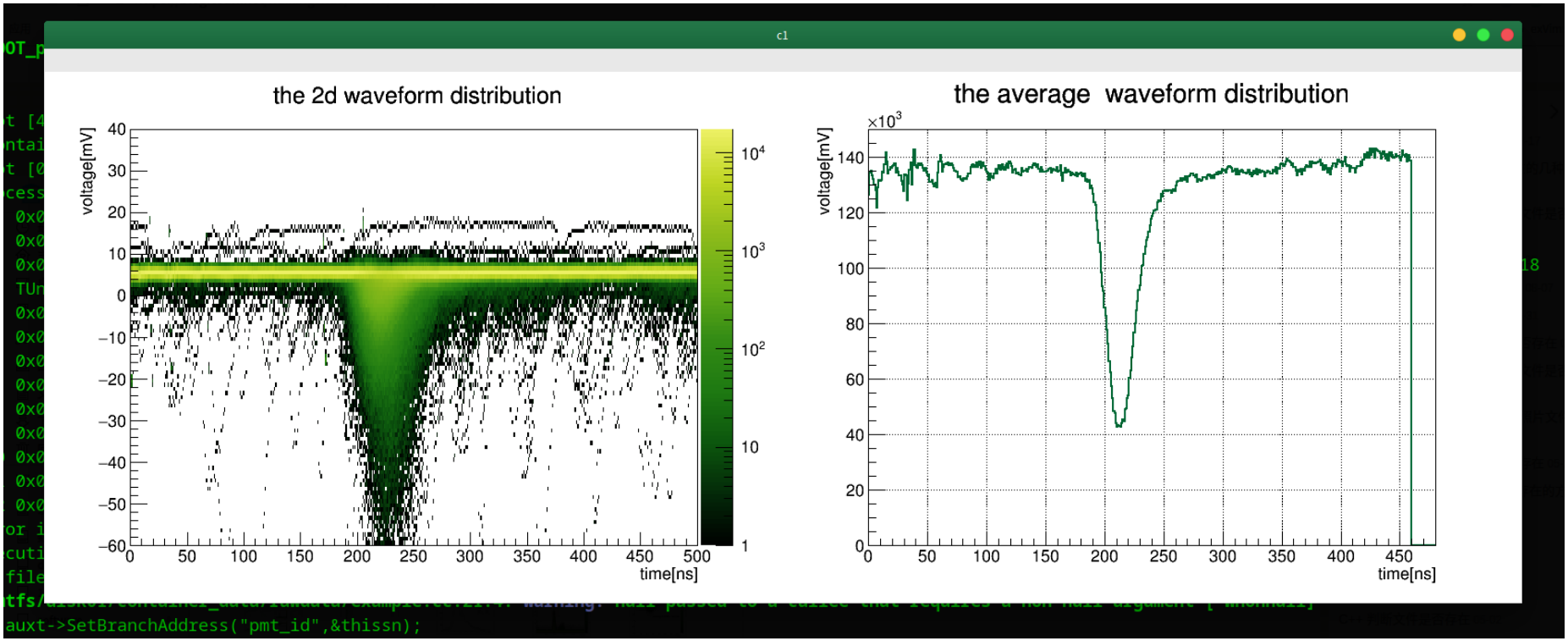
1. sotre the raw waveform data(.1pe, 1pe, TTS).
2. store the auxilary testing information(container , mass, HV, DCR. etc).
3. easy to manage (create, modify and update) and analyze.
4. one ane acquire almost all the data needed for analysis(of one PMT) from only one file rather than collecting the details from server.

prliminary file structure and strategies

- each PMT have one root file named in ”SN_rawdata.root”
- In a specific root file, we have several waveform waveform trees and a auxilary data tree
- if one PMT go through several tests in the container, all the data will be saved still in only one root file but with different name of wave trees[1]; their auxilary information will be filled several times in the same tree.

restore the waveforms

all the aveforms were stored as a vetor with 521 length, one can easily read and analysis the data, for example :



current states

finished:

- basic structure of root file and TTree
- example rawdata root file
- example cpp program to access the waveforms from the generated root file

still working on :

- refine the root file contents and structure
- writing the doucument for potential users

updates from shanghai colaberation meeting

summary

- the converting of raw data from binary to root format is almost done
- one can easily restore the test waveforms with no loss of information
- the file size[2] decrease about 20% after transform[3].
- the update of container results

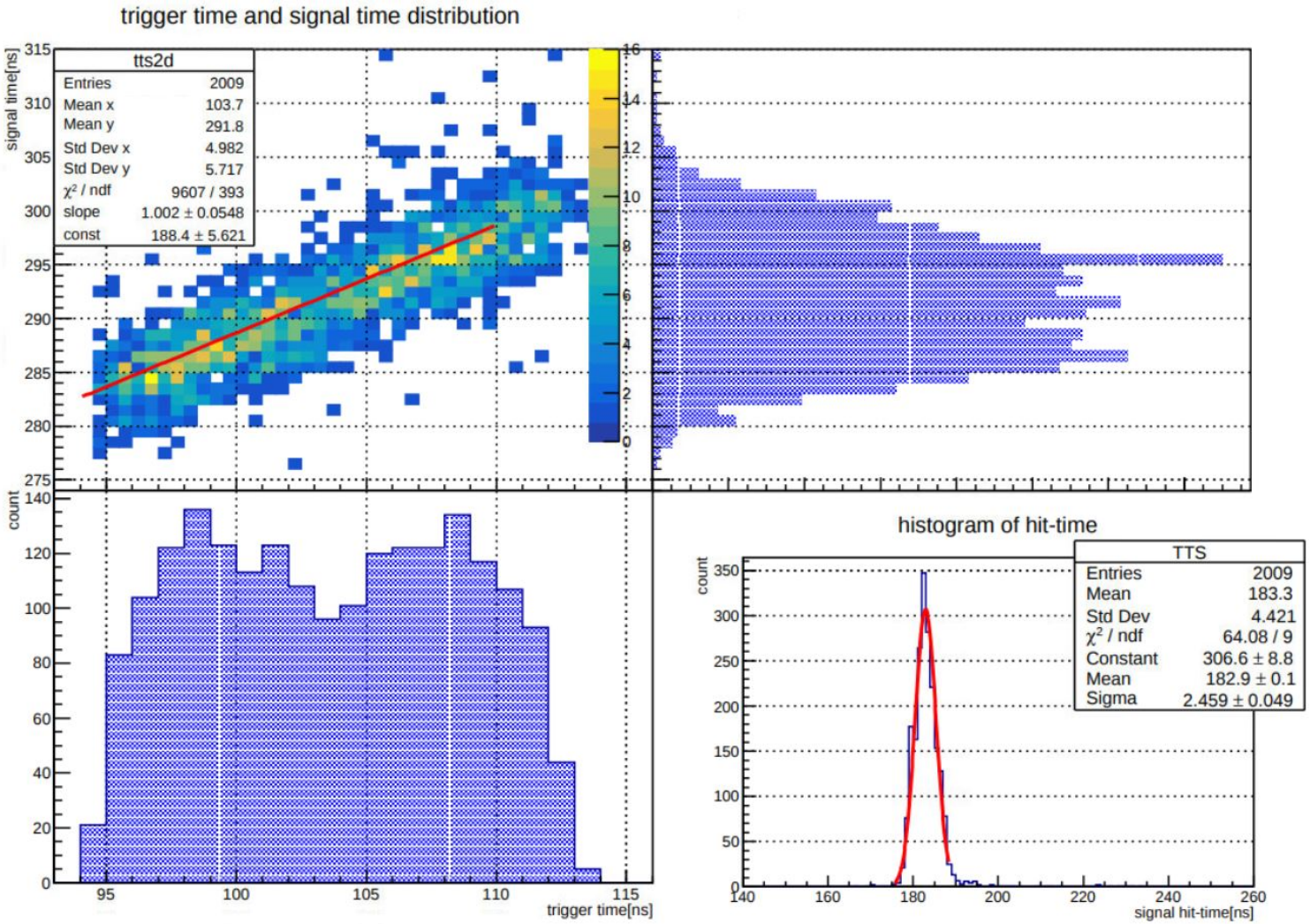
[2] the total additional disk space requirement for 20k is less than 2T, so this not a problem

[3] about 50MB for one PMT of one light intensity

THANKS

BACK-UP

TTS of HAMAMATSU PMT



图：hittime and trigger time