

Analyze of the Nov 2019 data

4/1/2019

The Data Set

<https://docs.google.com/spreadsheets/d/1Ub70086vW-macC1ocR4ZsCIA7uIAYV3xBdgqDGTuyHY/edit#gid=0>

- 30 PMTs / 2 digitizer boards
- Channels are connected in sequence
- Just one board in each run
- Each PMT has 3 voltages
- 5 PMTs as a group with HV (so in each run there are 5 PMTs with HV, with or without light; 10 PMTs without HV)
- The old light system was used

So, using the data:

- gain, dark rate, after pulse for the 30 PMTs
- Check the noise level

	A	B	C	D	E	F	G	H	I	J	K	L
19	OKay,	HV	window	trigger delay	post percent	Led	number of files	WW-N-1-1 (D2-1)	WW-N-1-2 (D2-2)	WW-N-1-3 (D2-3)	WW-N-1-4 (D2-4)	WW-N-1-5 (D2-5)
20	run 207	1200	10 us (5000 sam	10 us	50	On	16	-40	0	-120	-160	-160
21	run 208	1200	10 us (5000 sam	10 us	50	OFF	16	-40	0	-120	-160	-160
22	run 209	1250				On	17					
23	run 210	1250				OFF	16					
24	run 211	1300				On	16					
25	run 212	1300				OFF	16					
26	OKay,	HV	window	trigger delay	post percent	Led	number of files	WW-N-1-6 (D2-6)	WW-N-1-7 (D2-7)	WW-N-1-8 (D2-8)	WW-N-1-9 (D2-9)	WW-N-1-10 (D2-10)
27	run 213	1350	10 us (5000 sam	10 us	50	On	16	-120	0	-40	-40	-140
28	run 214	1350				OFF	17					
29	run 215	1400				On	16					
30	run 216	1400				OFF	17					
31	run 217	1450				On	17					
32	run 218	1450				OFF	17					
33	OKay,	HV	window	trigger delay	post percent	Led	number of files	WW-N-2-1 (D4-1)	WW-N-2-2 (D4-2)	WW-N-2-3 (D4-3)	WW-N-2-4 (D4-4)	WW-N-2-5 (D4-5)
34	run 219	1380	10 us (5000 sam	10 us	50	On	17	-80	-40	-100	-20	-160
35	run 220	1380				OFF	16					
36	run 221	1430				On	17					
37	run 222	1430				OFF	16					
38	run 223	1480				On	16					
39	run 224	1480				OFF	16					
40	OKay,	HV	window	trigger delay	post percent	Led	number of files	WW-N-2-6 (D4-6)	WW-N-2-7 (D4-7)	WW-N-2-8 (D4-8)	WW-N-2-9 (D4-9)	WW-N-2-10 (D4-10)
41	run 225	1380	10 us (5000 sam	10 us	50	On	17	-60	-140	-160	0	-380
42	run 226	1380				OFF	16					
43	run 227	1430				On	16					
44	run 228	1430				OFF	16					
45	run 229	1480				On	17					
46	run 230	1480				OFF	16					
47	OKay,	HV	window	trigger delay	post percent	Led	number of files	WW-N-3-1 (D6-1)	WW-N-3-2 (D6-2)	WW-N-3-3 (D6-3)	WW-N-3-4 (D6-4)	WW-N-3-5 (D6-5)
48	run 231	1200	10 us (5000 sam	10 us	50	On	10	-120	-180	-140	-200	-200
49	run 232	1400				On	16					
50	run 233	1400				OFF	19					
51	run 234	1450				On	16					
52	run 235	1450				OFF	20					
53	run 236	1500				On	16					
54	run 237	1500				OFF	22					
55	OKay,	HV	window	trigger delay	post percent	Led	number of files	WW-N-3-6 (D6-6)	WW-N-3-7 (D6-7)	WW-N-3-8 (D6-8)	WW-N-3-9 (D6-9)	WW-N-3-10 (D6-10)
56	run 238	1400	10 us (5000 sam	10 us	50	On	18	-80	0	-220	-220	-340
57	run 239	1400				OFF	16					
58	run 240	1450				On	16					
59	run 241	1450				OFF	16					
60	run 242	1500				On	20					
61	run 243	1500				OFF	16					

Analysis status – the tool

The idea is to use a centralized project developed by Andrea https://github.com/ascarpel/pmt_analysis

ascarpel / pmt_analysis

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No description, website, or topics provided.

37 commits 2 branches 0 packages 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

ascarpel Correct bug in Run.cc related to the parsing of filenames Latest commit 193d50e 13 hours ago

data	Repo structure
dbase	Ultimated logic to associate optical channel and pmt number. Example ...
inc	Add noise filter
macro	Update load_pmt_tchain.cc
production	Add new macro examples
src	Correct bug in Run.cc related to the parsing of filenames
waveform	Modified CMakeList to include Eigen
.gitignore	Add new macro examples
CMakeLists.txt	Modified CMakeList to include Eigen
README.md	Edit README.md and configure.sh with more comments
configure.sh	Correct bug in configure.sh

Branch: master icarus_pmt_analysis / macro /

Aiwu Zhang added loop subruns in charge_ana

..

charge_ana.cc added loop subruns in charge_ana

charge_ana.cc~ added loop subruns in charge_ana

loadLib.cc set configure.sh for both macro and bu

load_pmt_tchain.cc Ultimated logic to associate optical cha

noise_ana.cc added charge_ana in macro

plot_waveform.cc Modify Waveform.cc to include FFT and

run207_filenamelist.txt added loop subruns in charge_ana

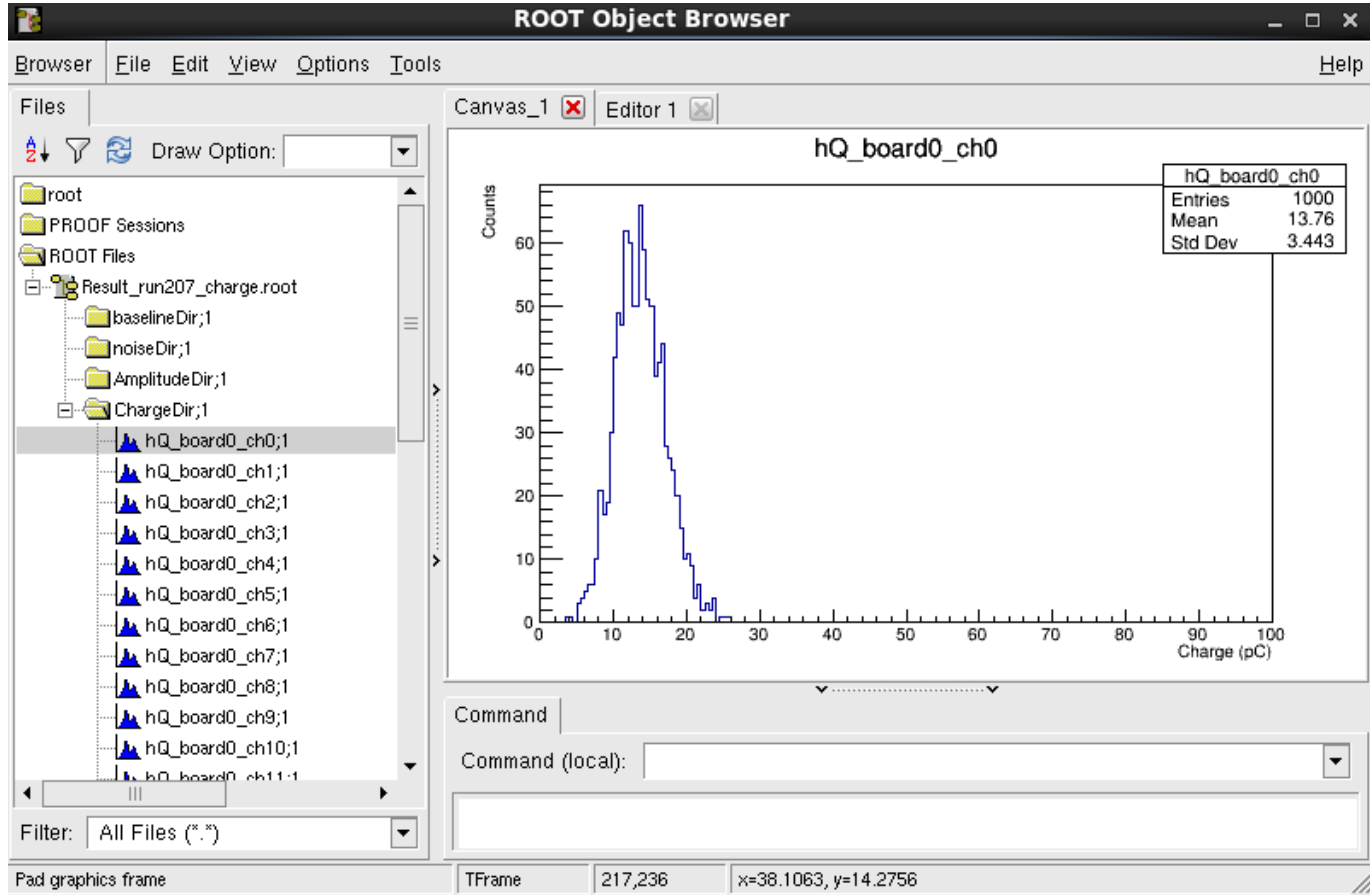
run207_filenamelist.txt~ added loop subruns in charge_ana

13 hours ago

We'll use macro for the Nov. data analysis

Analysis status – coming to results

- Obtain charge distributions



Next plans – on analysis

- Now we confirm the program works both on Fermilab/gpvm and on the server in Milind's office
- Continue to prepare the tool and use it to analyze the Nov. data (using the macro mode)
 - Austin has a poster presentation due on 4/17, we would like to include some initial results (eg. gain curves)
 - All gain curves, dark rate, for the 30 PMTs
 - Benchmarking the noise level for future comparison
- Move on to analyzing the Feb. data
 - Amelia has a report due in the summer
 - We want to tune the tool so that it will have all components for analyzing future data as well
 - All gain curves, dark rate, for all the PMTs & organize the results in database tables
 - Direct light results
 - Indirect light results

Next plans – on experiment commissioning

As the LAr filling to be completed (the east module is soon to be full), we're thinking about taking more PMT data

- We have a small data sample right since the cool down for one digitizer board, using which we can test the baseline stability
- We plan to take data for as many PMTs as possible to see the stabilization of the PMTs
 - -> first without HV
 - -> then with some HV. We're writing a proposal/plan to discuss on next week's PMT WG meeting
- Once we verify PMTs can be turned on, we want to take calibration runs as we did
 - -> to compare with room T data