

Instructions to analyze the MCP-PMTs CAEN digitizer data

A. Get a copy of the data:

In you terminal, do this command:

```
git clone git@github.com:Hattawy/MCPs_analysis_framework.git
```

The previous command will create “MCPs_analysis_framework” directory that looks like this:

```
drwxrwxr-x 6 mhattawy mhattawy 4.0K Jun 22 16:22 analysis_framework
drwxrwxr-x 2 mhattawy mhattawy 4.0K Jun 22 10:15 python-scripts
-rw-rw-r-- 1 mhattawy mhattawy 43K Jun 22 10:10 MCPs-analysis-
manual.pdf
drwxrwxr-x 8 mhattawy mhattawy 4.0K Jun 22 10:09 wavedump-3.7.4
drwxrwxr-x 2 mhattawy mhattawy 4.0K Jun 22 10:09 documents
-rw-rw-r-- 1 mhattawy mhattawy 25 Jun 22 10:08 README.md
```

- **analysis_framework**: has the updated lappd framework to analyze CAEN data.
- **wavedump-3.7.4**: has the software source files for the CAEN digitizer.
- **documents**: has CAEN digitizer pdf manuals.
- **python-scripts**: has python scripts written by Ed May to analyze the data.

B. Analyzing the data using lappd framework:

I. go inside analysis_framework

II. - Installation

1. Install the latest version of root on your linux/MasOS machine (www.root.cern.ch).
2. Create a new folder Rootdev/ in any directory on your machine.
3. Create sub-folders lib/, include/ and bin/ in Rootdev/

4. In .bashrc, add the following lines:

```
#ROOT setting
export ROOTDEV=ROODEVTDIR/ # Replace ROOTDEVDIR by your path
export PATH=$ROOTDEV/bin/:$PATH
export LD_LIBRARY_PATH=$ROOTDEV/lib:$LD_LIBRARY_PATH
```

5. Start a new terminal

6. Go to folder MCPs_analysis_framework/analysis_framework

8. Run install.sh (you may need to do `chmod +x install.sh`)

Now the installation is done. The files can be found in Rootdev/bin

III. Analysis:

1. Go inside MCPs_analysis_framework/analysis_framework/lappd_root-analyzer

2. add the directory of your new data inside the file
“run_lappd_root_all_runs”

3. run the compiler as (./run_lappd_root_all_runs initial_run_number
final_run_number)

This will do the whole process of converting the binary file to txtfile, then process them with lappd, plot the individual distributions of each run and creates a folder for each run.

Please feel free to ask if you have any question about running the scripts.

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