

# MONICA\_software

- based on CoMPASS RAW data lists .root
- parent directory of DAQ/ CoMPASS project

# To get the softwares

In terminal if git installed on the computer (true for ANL bavarians computer)

```
git clone -b MONICA_softwares https://github.com/CFougeres/MUSIC_CoPASS_softwares; mv MUSIC_CoPASS_softwares/ MONICA_softwares/;
```

```
Last login: Fri Sep 15 15:33:14 on ttys002
(base) chloefougeres@MacBook-Pro-de-Chloe MONICA_DAQ_Software % cd
(base) chloefougeres@MacBook-Pro-de-Chloe ~ % git clone -b MONICA_softwares https://github.com/CFougeres/MUSIC_CoPASS_softwares; mv MUSIC_CoPASS_softwares/ MONICA_softwares/;
Cloning into 'MUSIC_CoPASS_softwares'...
remote: Enumerating objects: 223, done.
remote: Counting objects: 100% (164/164), done.
remote: Compressing objects: 100% (114/114), done.
remote: Total 223 (delta 60), reused 105 (delta 39), pack-reused 59
Receiving objects: 100% (223/223), 34.57 MiB | 39.12 MiB/s, done.
Resolving deltas: 100% (68/68), done.
```

From Github website [https://github.com/CFougeres/MUSIC\\_CoPASS\\_softwares](https://github.com/CFougeres/MUSIC_CoPASS_softwares)

1. Select *MONICA\_softwares* branch  
by opening the branch tab

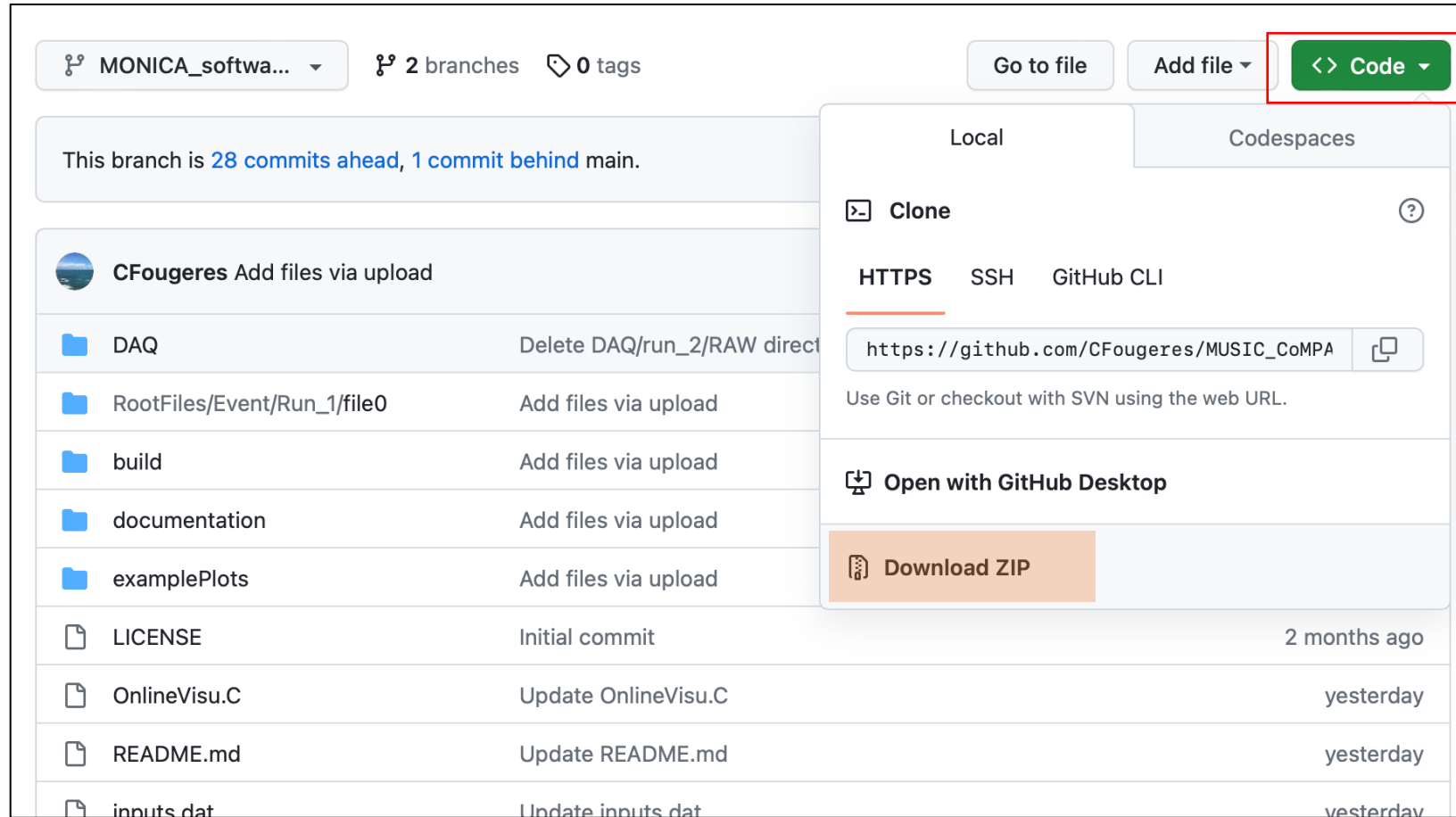
The screenshot shows the GitHub repository page for **MUSIC\_CoPASS\_softwares**. The repository is public and has 2 branches and 0 tags. The **MONICA\_softwares** branch is selected and highlighted with a red box. A dropdown menu for switching branches is open, showing the **MONICA\_softwares** branch as the selected option. The repository page also shows commit history and a 'Code' button.

Commit Hash	Commit Message	Commit Date
0d6a6a5	Delete DAQ/run_2/RAW directory	yesterday
	Add files via upload	yesterday
	Add files via upload	yesterday

# To get the softwares

**From Github website** [https://github.com/CFougeres/MUSIC\\_CoMPASS\\_softwares](https://github.com/CFougeres/MUSIC_CoMPASS_softwares)

1. Select MONICA\_software branch
2. **Download the code** .zip by opening the « code » green tab



3. Rename directory as MONICA\_softwares

# Directory structure

## MONICA\_softwares/

OnlineVisu.C

→ code for online visualization

inputs.dat

→ user inputs, self-explanatory (run data to see online, time window in  $\mu$ s..)

DAQ/

→ for CoMPASS runs

RootFiles/

Event/

Run\_#/ → for *Run Event trees*

build/

BuildingEvent.C

→ code for building Run Event trees from CoMPASS *Raw Lists trees*

DAQTopology.h

→ matrix to translate Digitizer Channels to Physical Signals

Builder.h

OnlineVisu.h

cpFile.sh mkRunDir.sh → bash scripts to create folders for storing *Run Event trees*

examplePlots/

documentation/

README.md

LICENSE

# To run the code

## In terminal

cd MONICA\_softwares/  
root OnlineVisu.C

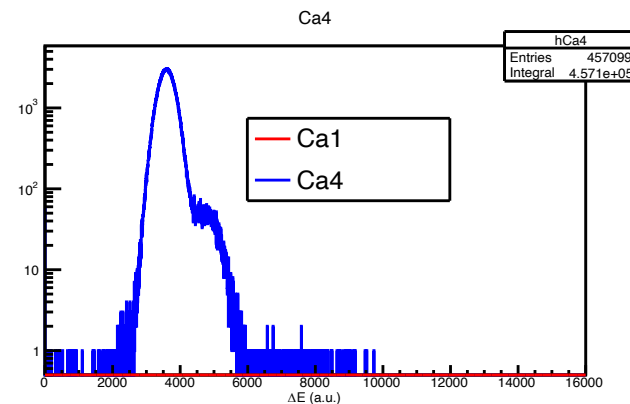
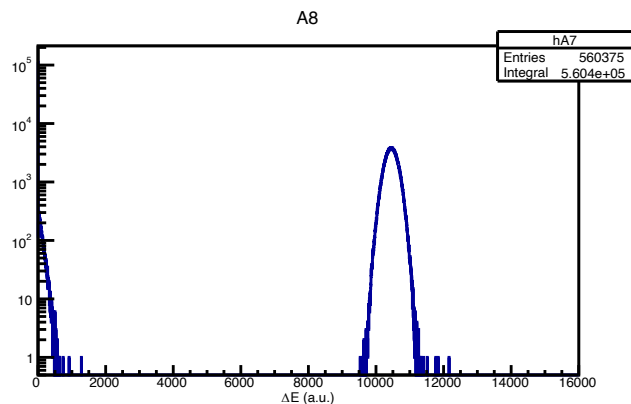
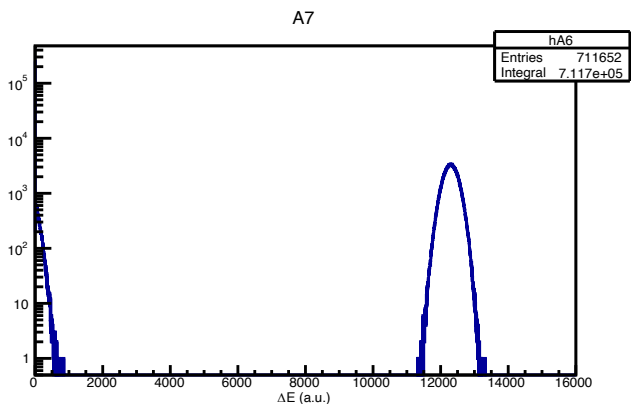
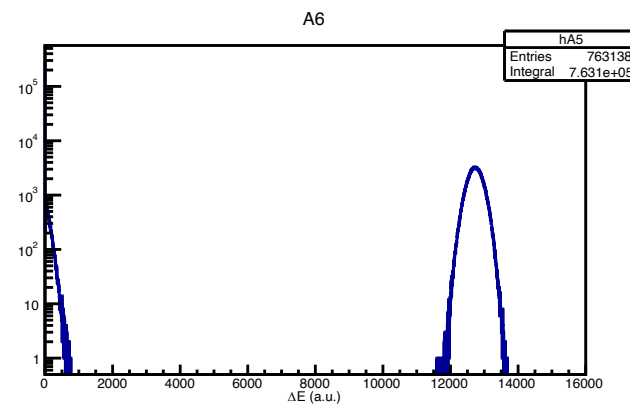
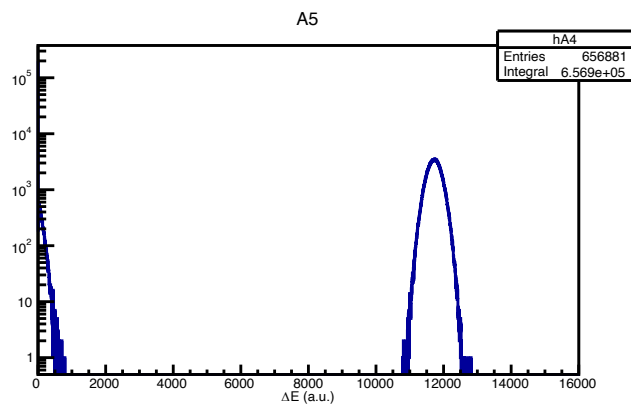
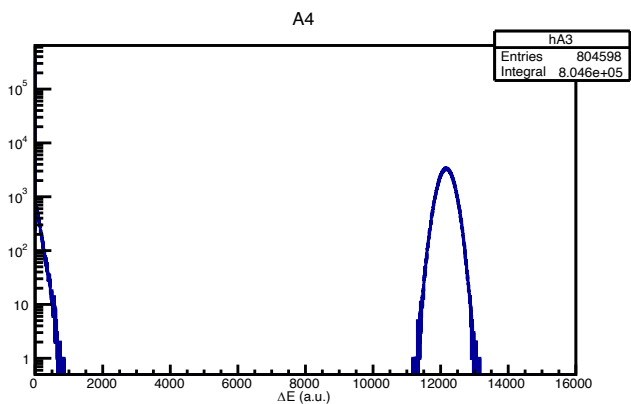
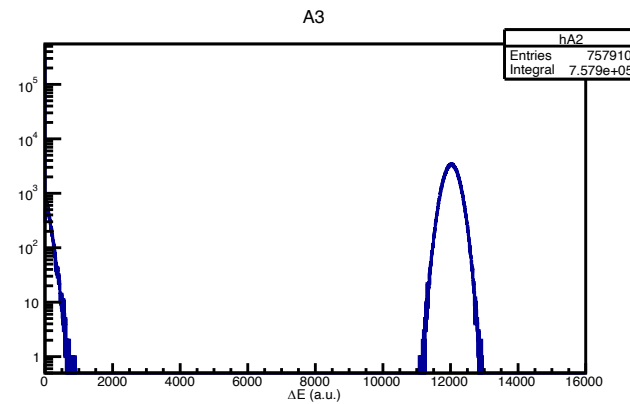
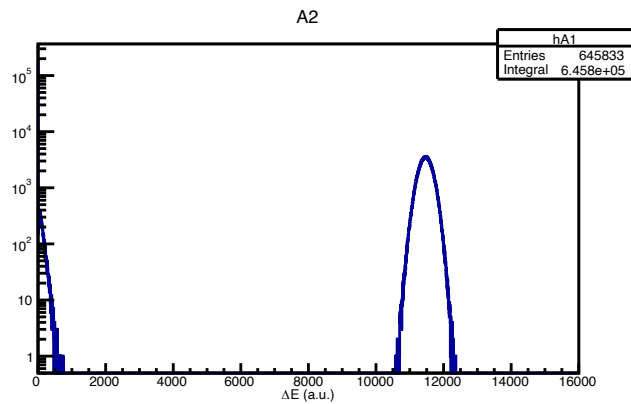
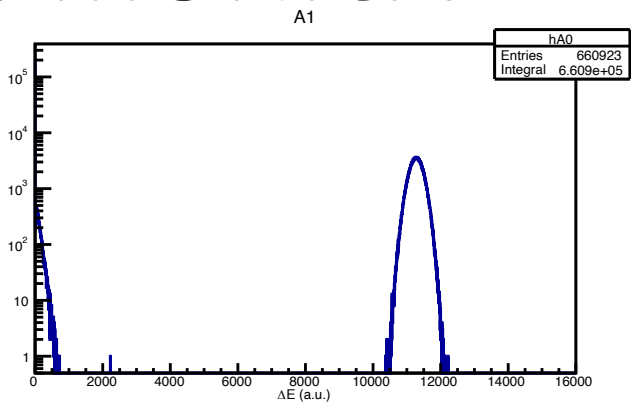
```
((base) chloefougeres@MacBook-Pro-de-Chloe MONICA_DAQ_Software % root OnlineVisu.C

-----
| Welcome to ROOT 6.26/06                               https://root.cern |
| (c) 1995-2021, The ROOT Team; conception: R. Brun, F. Rademakers |
| Built for macosxarm64 on Jul 28 2022, 18:08:51 |
| From tags/v6-26-06@v6-26-06 |
| With Apple clang version 13.1.6 (clang-1316.0.21.2.5) |
| Try '.help', '.demo', '.license', '.credits', '.quit'/.q' |
|-----

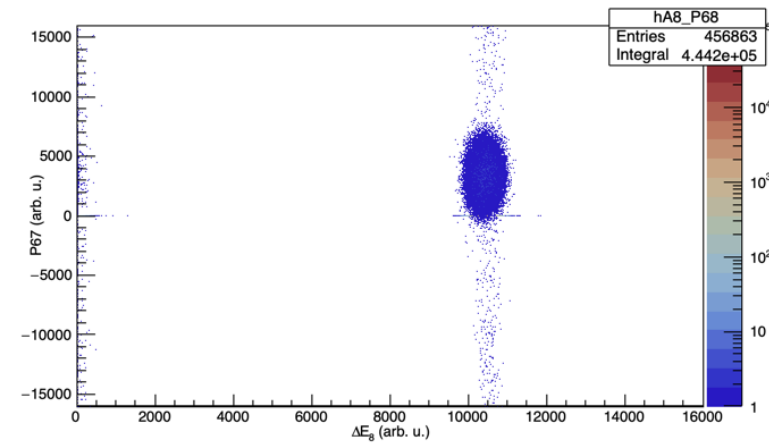
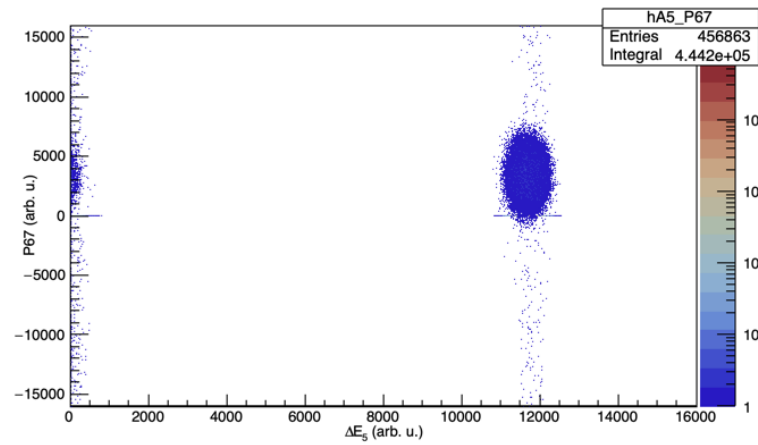
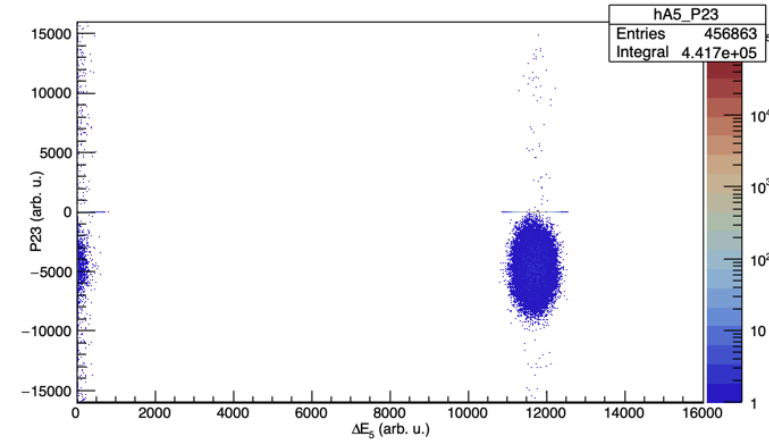
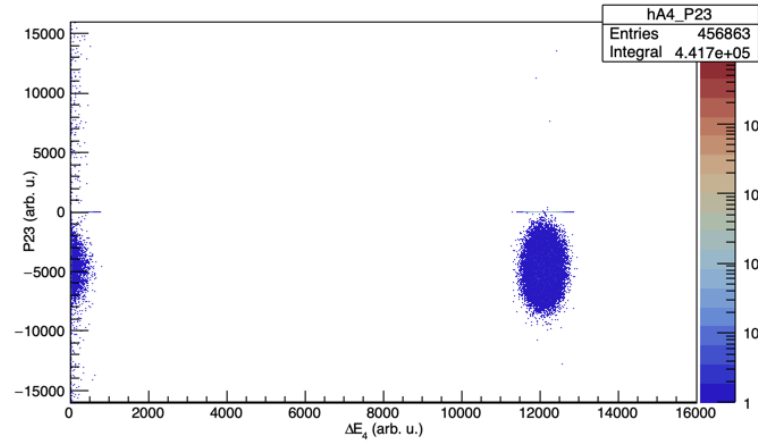
root [0]
Processing OnlineVisu.C...
In file included from input_line_8:1:
In file included from /Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/OnlineVisu.C:4:
In file included from /Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/build/OnlineVisu.h:5:
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/build/Builder.h:78:12: warning: unknown escape sequence '\N' [-Wunknown-escape-sequence]
    cout<<"\NumberOfRun " <<" RunsNumbers "<<" FilesPerRun " <<" InitSubFiles " <<endl;
    ^~
=====
===      OnlineVisu      ===
=====
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/inputs.dat
0 GENERAL
1 TimeWindow 5
2 ONLINEvisu
3 NumberOfRun 1
7 RangePositionCoeff 200000
NumberOfRun  RunsNumbers  FilesPerRun  InitSubFiles
1 1 0
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/DAQ/run_1/RAW/DataR_run_1.root
6018409
sorted
root [1] █
```

*user' inputs, controlling inputs.dat file is properly read*

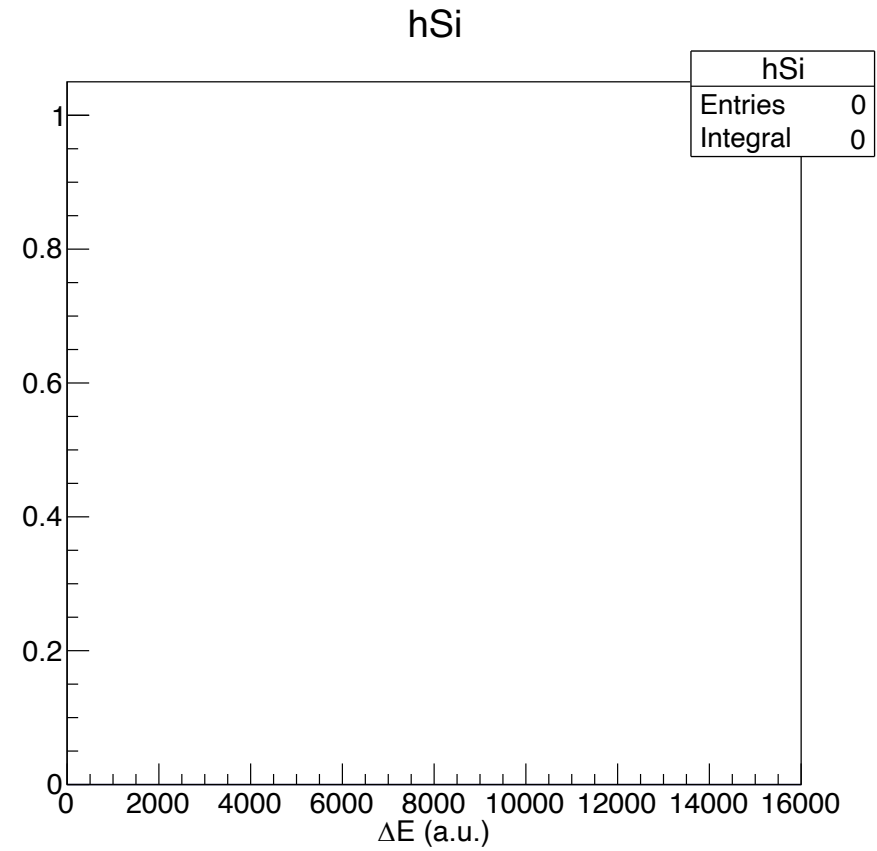
# Plots MONICA



# Plots MONICA

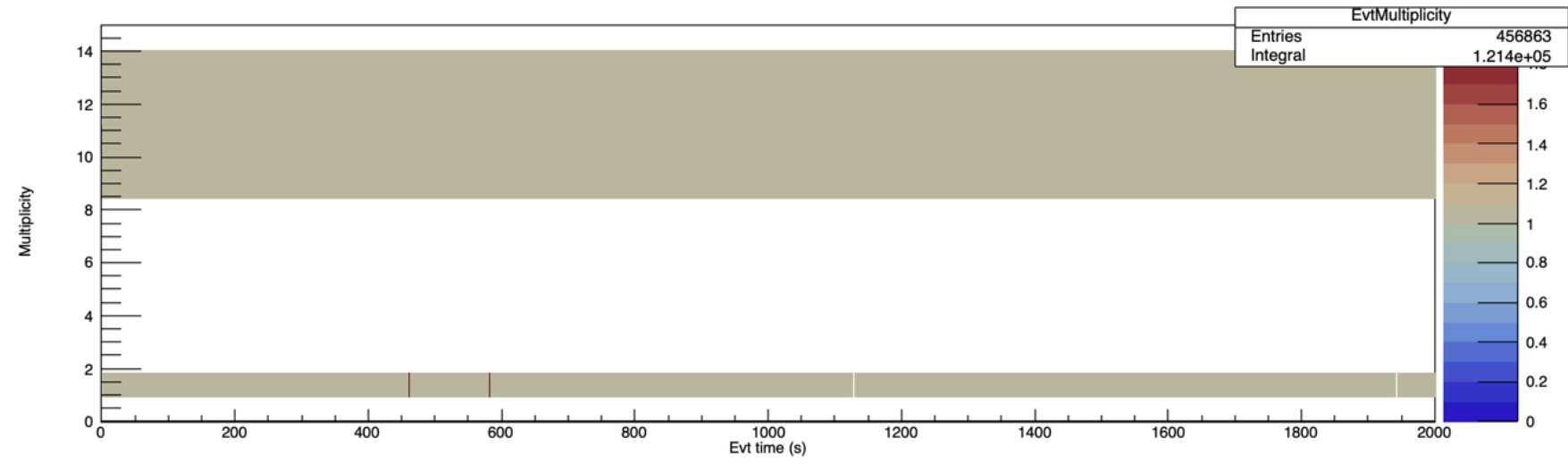
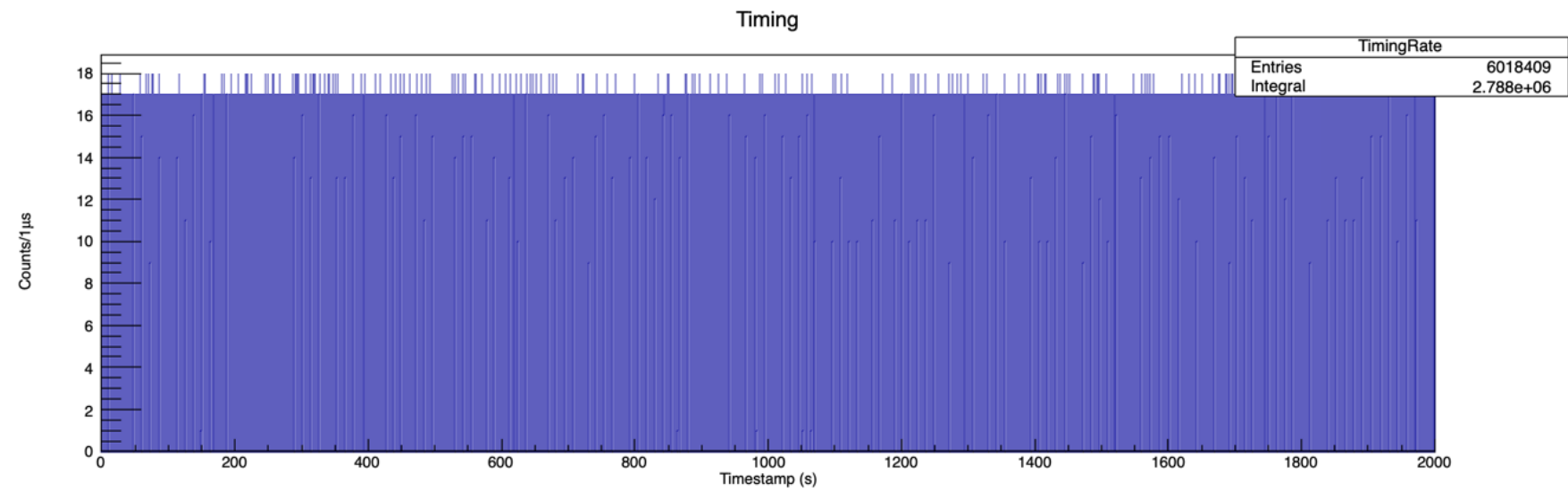


# Plots Silicon





# Plots Rates



# To run the code

## In terminal

cd MONICA\_softwares/  
root build/BuildingEvent.C

## In opened Root terminal

BuidingEvent(run\_number,  
subfile\_number)

```
(base) chloefougeres@MacBook-Pro-de-Chloe MONICA_DAQ_Software % root build/BuildingEvent.C

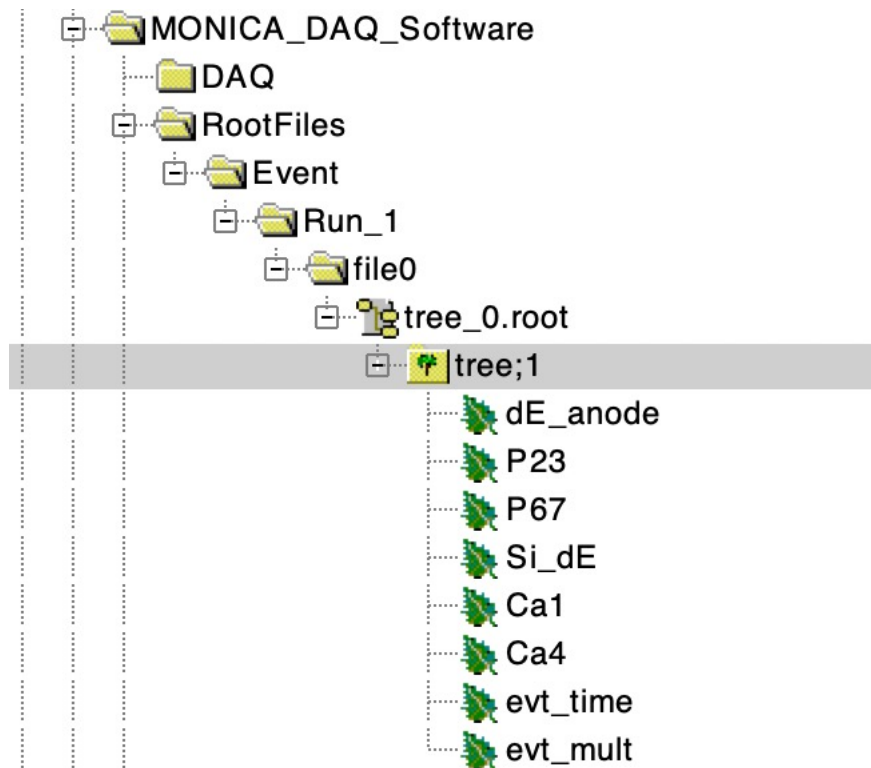
-----
| Welcome to ROOT 6.26/06                                     https://root.cern |
| (c) 1995–2021, The ROOT Team; conception: R. Brun, F. Rademakers |
| Built for macosxarm64 on Jul 28 2022, 18:08:51 |
| From tags/v6-26-06@v6-26-06 |
| With Apple clang version 13.1.6 (clang-1316.0.21.2.5) |
| Try '.help', '.demo', '.license', '.credits', '.quit'/'.' |
-----

root [0]
Processing build/BuildingEvent.C...
In file included from input_line_8:1:
In file included from /Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/build/BuildingEvent.C:5:
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/build/Builder.h:78:12: warning: unknown escape sequence '\N' [-Wunknown-escape-sequence]
    cout<<"NumberOfRun " <<" RunsNumbers "<<" FilesPerRun " <<" InitSubFiles " <<endl;
                          ^
input_line_9:2:2: error: no matching function for call to 'BuildingEvent'
    BuildingEvent() /* .x tries to invoke function `BuildingEvent` */
    ^
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/build/BuildingEvent.C:8:5: note: candidate function not viable: requires 2 arguments, but 0 were provided
int BuildingEvent(int RunNumber, int file)
    ^
root [1] BuildingEvent(1,0)
=====
===      Builder of Events Tree      ===
=====
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/inputs.dat
0 GENERAL
1 TimeWindow 5
2 ONLINEvisu
3 NumberOfRun 1
7 RangePositionCoeff 200000
NumberOfRun  RunsNumbers  FilesPerRun  InitSubFiles
1 1 0
/Users/chloefougeres/Documents/post_doc/argonne/work/experiment/MONICDA/MONICA_DAQ_Software/DAQ/run_1/RAW/DataR_run_1.root
6018409
sorted
0.000282467
0.000548318
0.000830784
0.00104679
0.00121295
0.00149541
0.00164495
0.00192742
0.00209358
0.00235943
0.0025422
0.00277482
0.00294098
0.00319021
0.00340622
0.00365545
0.00387146
0.00413731
0.00433669
0.00451947
0.0047687
0.00498471
0.00526717
0.00541671
```

*user' inputs, controlling inputs.dat file is properly read*

*progress of conversion is shown (in %)*

# Event tree structure



```
*****
*Tree      :tree      : tree
*Entries   : 45585 : Total = 5489530 bytes File Size = 1355793 *
*          :       : Tree compression factor = 4.05
*****
*Br    0 :dE_anode : dE_anode[8]/D
*Entries : 45585 : Total Size= 2926511 bytes File Size = 660124 *
*Baskets : 92 : Basket Size= 32000 bytes Compression= 4.43 *
*.....*
*Br    1 :P23      : P23/D
*Entries : 45585 : Total Size= 366065 bytes File Size = 117442 *
*Baskets : 12 : Basket Size= 32000 bytes Compression= 3.11 *
*.....*
*Br    2 :P67      : P67/D
*Entries : 45585 : Total Size= 366065 bytes File Size = 101885 *
*Baskets : 12 : Basket Size= 32000 bytes Compression= 3.59 *
*.....*
*Br    3 :Si_dE    : Si_dE/D
*Entries : 45585 : Total Size= 366097 bytes File Size = 2848 *
*Baskets : 12 : Basket Size= 32000 bytes Compression= 128.35 *
*.....*
*Br    4 :Ca1      : Ca1/D
*Entries : 45585 : Total Size= 366065 bytes File Size = 2823 *
*Baskets : 12 : Basket Size= 32000 bytes Compression= 129.48 *
*.....*
*Br    5 :Ca4      : Ca4/D
*Entries : 45585 : Total Size= 366065 bytes File Size = 111348 *
*Baskets : 12 : Basket Size= 32000 bytes Compression= 3.28 *
*.....*
*Br    6 :evt_time : evt_time/D
*Entries : 45585 : Total Size= 366145 bytes File Size = 308677 *
*Baskets : 12 : Basket Size= 32000 bytes Compression= 1.18 *
*.....*
*Br    7 :evt_mult : evt_mult/D
*Entries : 45585 : Total Size= 366145 bytes File Size = 48341 *
*Baskets : 12 : Basket Size= 32000 bytes Compression= 7.56 *
*.....*
```