CLEAR_exp5-9

Run list	Sergii
Logbook	Sergii
HV PS data	Federico
Scope signal shape (ch. #1 and #2)	Federico
Digitizers	Pietro + Sergii
Bergoz current measurements	Pietro + Sergii
Position of sateges (timber)	Pietro + Sergii
Data storage area (Cernbox)	Mauro

Status of the analysis

- Digitizer
- Bergoz

Where is data saved?

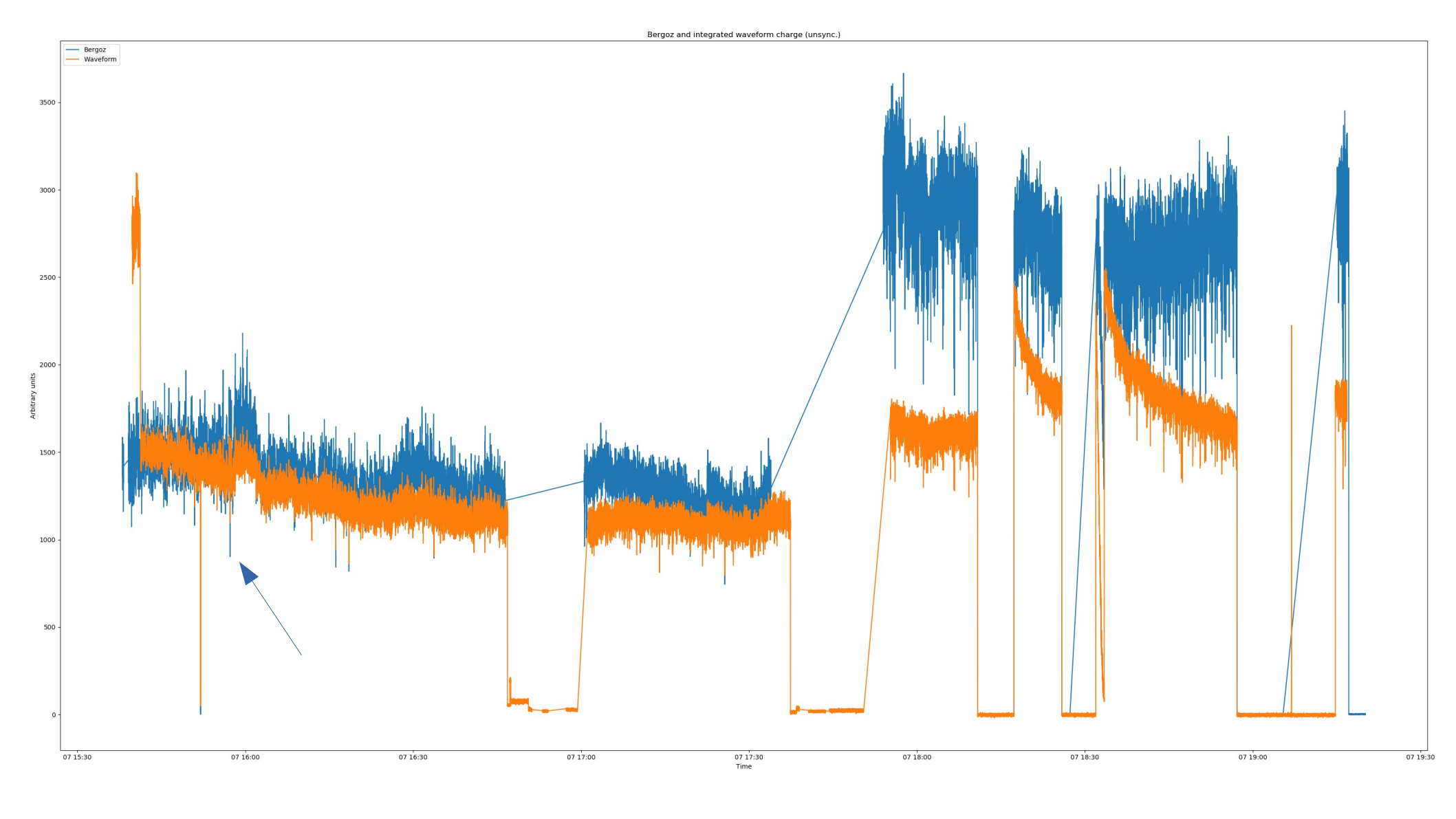
- Bergoz + digitizer
  - https://cernbox.cern.ch/index.php/s/hv4N3C5rZhARzqj
- PSU
  - /afs/cern.ch/work/f/flasagni/public/TestbeamLUXE.zip
- Motors + general system logs
  - https://timber.cern.ch/
    - CA.BCMTHZ:Acquisition:charge (bergoz 1Hz (logged charge) = (beam charge)/2)
    - CA.AIR-TS.02:Acquisition:position (motor: horizontal stage)
    - CA.AIR-TS.03:Acquisition:position (motor: vertical stage)

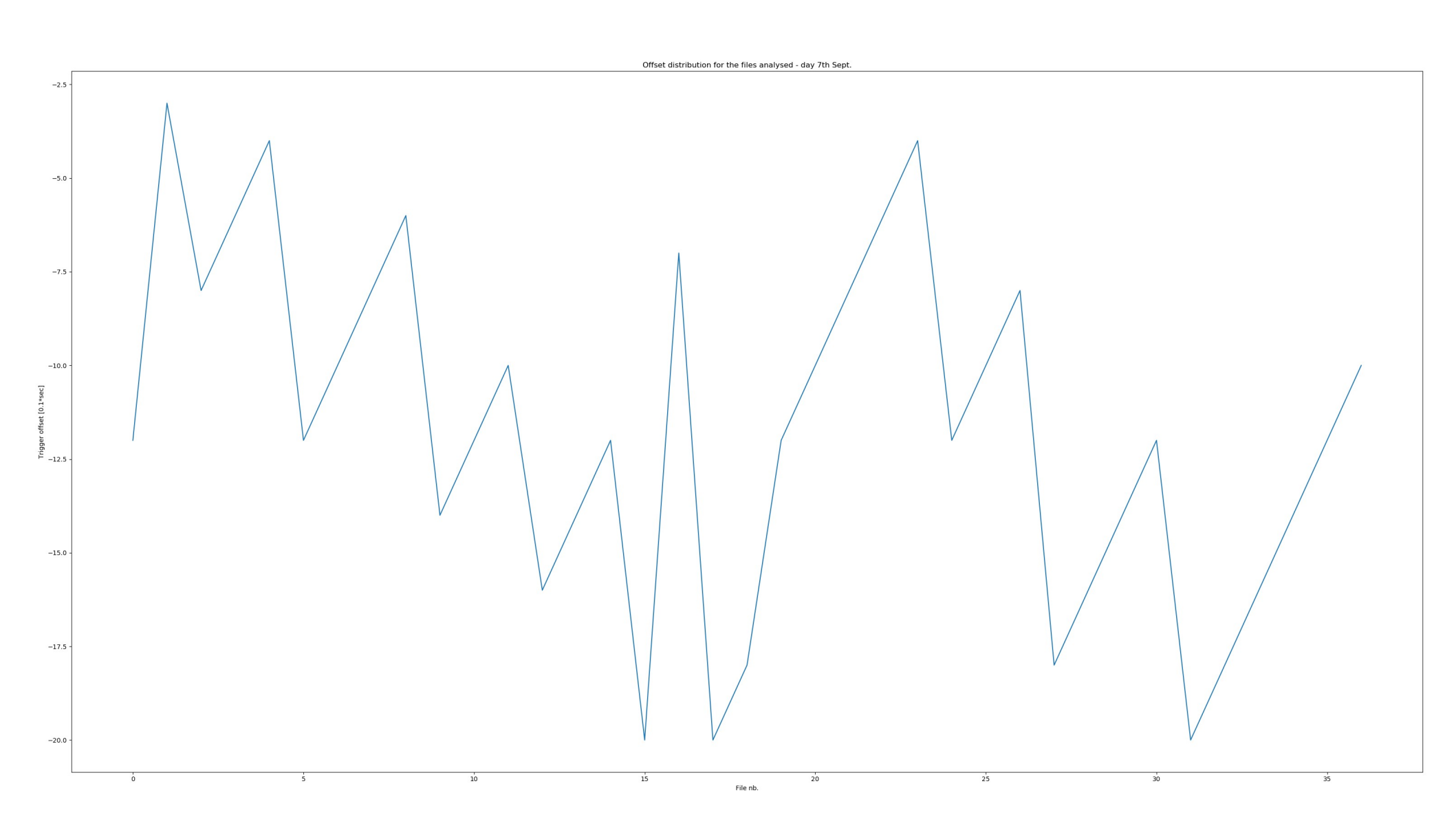
Digitizer

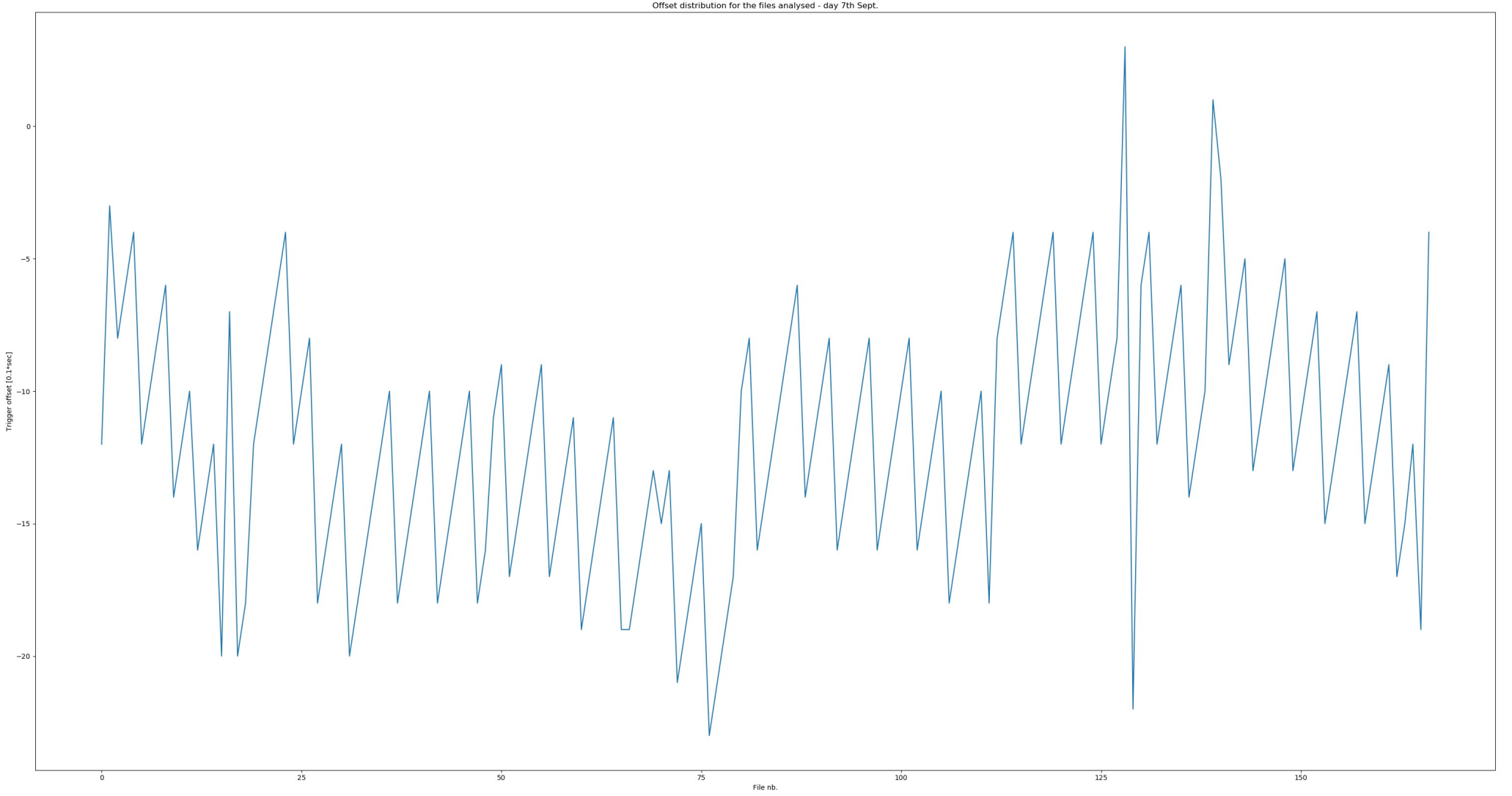
- Digitizer data is saved in MATLAB binary files
- A MATLAB script is developed to export the waveforms from matlab (binary) to tabular ASCII readable format (csv)
- Tabular data is fed into a Python script (pre-processing) which
  - represents first check tool of acquired data
  - does time integration of the bare waveforms
  - generates and attach (unix) timetags to the integrated charge/trigger
  - reads Bergoz data (10Hz) for the beam charge, and finally
  - synchronizes beam charge data with digitizers data

Synchronization

- In either digitizer or bergoz data there is not a universal timecode attached to each trigger.
- Time information regards the instant file (with say 600 triggers = 1minute) is saved on disk.
- Files are saved at slight different time on disk. Therefore, different time offsets are present between continuous measures (file1 16:01 , 600triggers → file2 16:02 , 600triggers → …) saved on different files.
- Self correlation between Bergoz and Digitizer’s integrated charge gives different time offsets allowing for perfect synchronization of the many (file) data patches


Bergoz and integrated waveform charge (unsync.)
Bergoz
Waveform
Arbitrary units
3500
3000
2500
2000
1500
1000
500
0
07 15:30
07 16:00
07 16:30
07 17:00
07 17:30
07 18:00
07 18:30
07 19:00
07 19:30
Time


Offset distribution for the files analysed - day 7th Sept.
−2.5
−5.0
−7.5
−10.0
−12.5
−15.0
−17.5
−20.0
Trigger offset [0.1*sec]
0
5
10
15
20
25
30
35
File nb.


Offset distribution for the files analysed - day 7th Sept.
Trigger offset [0.1*sec]
0
−5
−10
−15
−20
0
25
50
75
100
125
150
File nb.