

Graphs

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1 Introduction

Photomultiplier tubes (photomultipliers or PMTs for short), members of the class of vacuum tubes, and more specifically phototubes, are extremely sensitive detectors of light in the ultraviolet, visible, and near-infrared ranges of the electromagnetic spectrum. These detectors multiply the current produced by incident light by as much as 100 million times (i.e., 160 dB), in multiple dynode stages, enabling (for example) individual photons to be detected when the incident flux of light is very low.

Each PM (photoelectric electron-multiplier tube) are plugged to a SAM (serial access memory). This input gives us 2 channels :

- a low gain (*1)
- a hight gain (*20)

The SAM is recording the gain across 256 cells but We will focus on a single window defined by :

- **nd** : the number of the cell, the window begin on (1-256)
- **nf** : the size of window given by a number of cell

There is also some values that should be compute by the electronic card and send to the user :

- **t0** : gives the number of the cell that contains the maximum gain
- **tot** : gives the number of cells on the windows that have a higher gain than the threshold value

Te electronic card may return two type of data frames :

- the DAQ **Sample**
- the DAQ **Charge**

2 Daq Charge

The DAQ **Charge** data returns the sum of the **nf** gain from the defined window. It is the standard mode.

We use histogramme to display its informations :

- Horizontally : Q, the sum gain value on the window (computed by the hardware)
- Vertically : N, the number of ocurancy we found this value

3 Daq Sample

The `DAQ Sample` return all the `nf` gain from the defined window. It is the debugging mode.

We use plot to display its information :

- Horizontally : S, the cells (or samples) of the defined window
- Vertically : Q, the gain value on this cell

We also plot the average informations :

- Horizontally : S, the cells (or samples) of the defined window
- Vertically : Q, the average gain value on this cell

And we plot an histogramme that display the occurancy of the window's sum gains as for the `DAQ Charge` :

- Horizontally : Q, the sum gain value on the window (computed by the software)
- Vertically : N, the number of occurancy we found this value