

HGTD meeting - IHEP

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Overview

- Basic plotting and fitting scripts are developed for the test beam analysis
- Pushed it to gitlab
 - Public use
 - <https://gitlab.cern.ch:8443/mayoub/testbeamanalysis/tree/master>
- See details (Next slides)

Structure

CommonParams.C: include constants, set binning, declare name of variables to plots,...

FillHistograms.C: Get the branches from root files and fill them as histograms

DrawHistograms.C: Draw the histograms filled by FillHistograms.C

FitDistribution.C: A function to make a fit (for charge)

How to run

- The code is designed to produce histograms for the 8 channels of the oscilloscope
 - A histogram is filled for each channel and can be drawn and fitted
- The input files must be put in a directory called “Data”
- **runAnalysis.sh** is the running script
 - To fill the histograms: **./runAnalysis.sh -h ++config input_file**
 - To draw: **./runAnalysis.sh -d ++config input_file ++var charge +channel 0**
 - To fit: **./runAnalysis.sh -f ++config input_file ++var charge +channel 0**

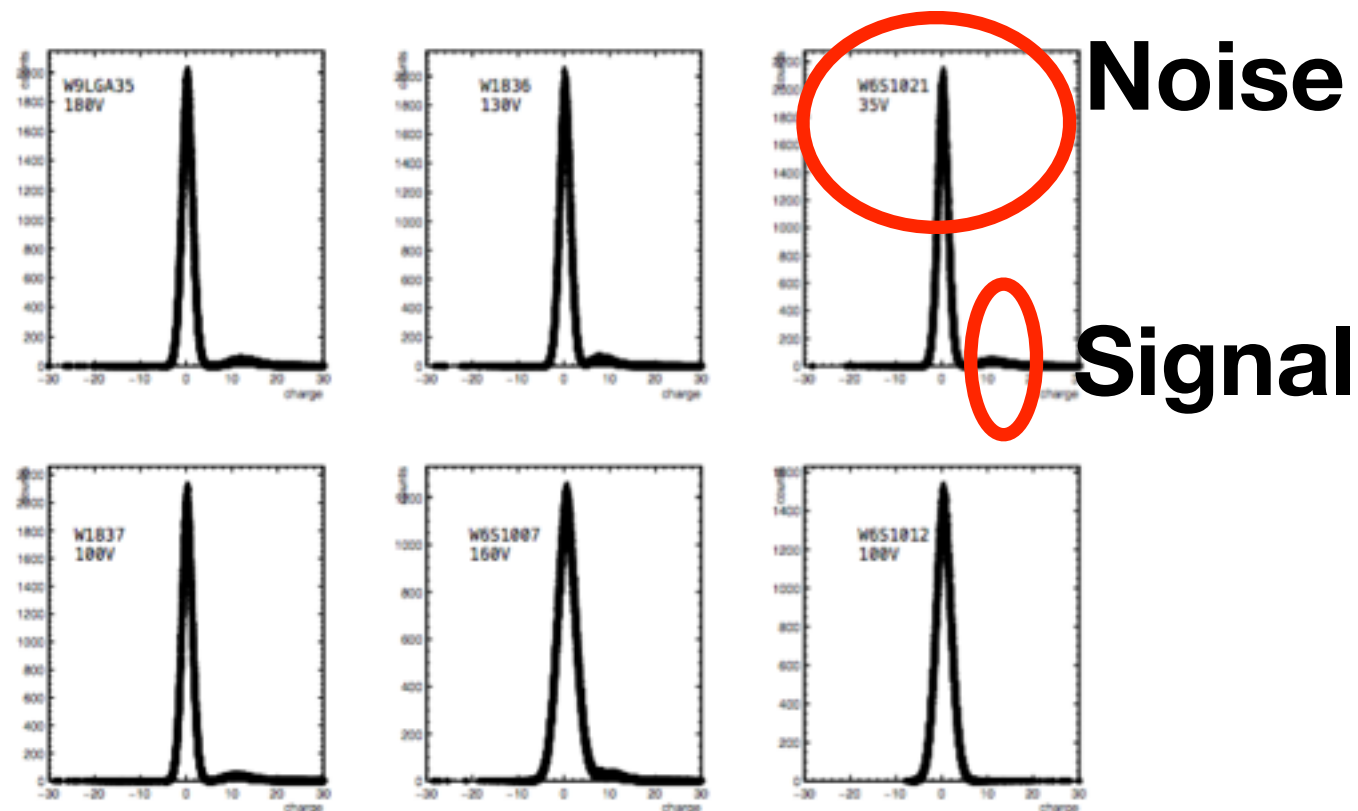
To be done

- The fit for the charge is a Gaussian convoluted with a landau fit
- For the moment, it is fitting simply a range of charge defined manually
- Suggestions for Suyu (and Bo) for her task:
 - Implement the functionality to select the signal pic like what is done by the other groups
 - Details in backup

Backup

How to read the charge? (2)

- For the variable charge, there is a peak at 0
- This is noised need to be cut off
- The signal is a small peak next to it



How to select the signal peak

- There are two methods
 - **The simple one** where we apply a simple cut on the charge to zoom on the signal peak
 - But this is not accurate because there is some overlap between the signal and noise (especially for irradiated sensors)
 - Will use it for the time stability study
 - **The accurate one:**
 - compute Δt (SiPM, DUT) using the time at the maximum (timeAtMax in the ntuples) but using an other variable doesn't make any significant differences
 - Fill a histogram with a bin width of 200ps
 - Find the bin with the largest content and take a 2ns window around it