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# Test-Beam Measurements

## General Information

The working directory is '/home/telescope/investigator-software'.

The measurement is composed of three different steps:

1. Pedestal measurement
2. Analysis of pedestal measurement
3. Data taking

The different steps are described in the following.

## Pedestal Measurement

Before starting the Investigator data taking, a pedestal measurement needs to be performed. During data taking, the Investigator software can then use the pedestal measurement to extract the noise level and set a trigger threshold on the value of signal/noise.

To record the pedestal measurement the RunControl needs to be started first in a separate terminal from the directory ' ' with the command './RCGui', since the Investigator software waits for a start-command, which can be sent from RunControl:

- Start the pedestal measurement in the investigator-software directory with the command 'sudo ./pedestalMeasurements.sh \$chip\_number\$ \$mini\_matrix\$' and wait till Investigator is ready.
- Go to the tab 'set parameters (without starting measurements)' in the RunControl Gui and send the start-command to the Investigator software by clicking on 'Investigator start'.
- Wait until the Investigator software has at least recorded 500 events (visible in print out of ./pedestalMeasurements.sh script) before clicking on 'Investigator stop' in the RunControl Gui.
- After the Investigator software has written the events (visible in print out of ./pedestalMeasurements.sh script: 'finished writing'), the Investigator software is stopped by stopping the script ./pedestalMeasurements.sh with ctrl-c.

A directory 'data/investigator/lab/ch\$chip\_number\$\_mm\$mini\_matrix\$/pedestal/' has been created containing the data of the pedestal measurements.

## Important notes

- The bias voltage is hard coded as 'VBB\_LIST' in the script ./pedestalMeasurements.sh
- If the pedestal measurement was not recorded correctly, the directory 'data/investigator/lab/ch\$chip\_number\$\_mm\$mini\_matrix\$/pedestal/' needs to be deleted, since the pedestal measurement is not overwritten, once a directory has been created for the parameters the pedestal value depends on:
  - ◆ Chip number
  - ◆ Mini matrix
  - ◆ Reset voltage
  - ◆ Bias voltage
- During beam one should check, that the pedestal measurement is taken in the time between the spills.

## Analysis of pedestal measurement

In a next step the pedestal measurement needs to be analysed to extract the noise level. For this the script 'sourceMeasurements.sh' needs to be started:

- Type the command 'sudo ./sourceMeasurement.sh \$chip\_number\$ \$mini\_matrix\$ \$trigger threshold [signal/noise]\$', while the last parameter \$trigger threshold [signal/noise]\$ can be set to an arbitrary value.
- If the Investigator is ready, click on 'Investigator start' in the RunControl Gui.
- Wait until the print out from the script './sourceMeasurement.sh' says, that the pedestal measurement has been analysed and click on 'Investigator stop' in the RunControl Gui.
- Stop the script './sourceMeasurement.sh' with ctrl-c.

A file 'name' with the single pixel noise values as the xth parameter has been created in the directory 'x'.

### Important notes

- The bias voltage is hard coded as 'VBB\_LIST' in the script ./sourceMeasurements.sh

Data taking

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This topic: CLIC > InvestigatorDataTaking

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