Status of ECAL data calibration for Run-6

Sakulin Dmitriy
Ecal group

ECal RUN-6 setup

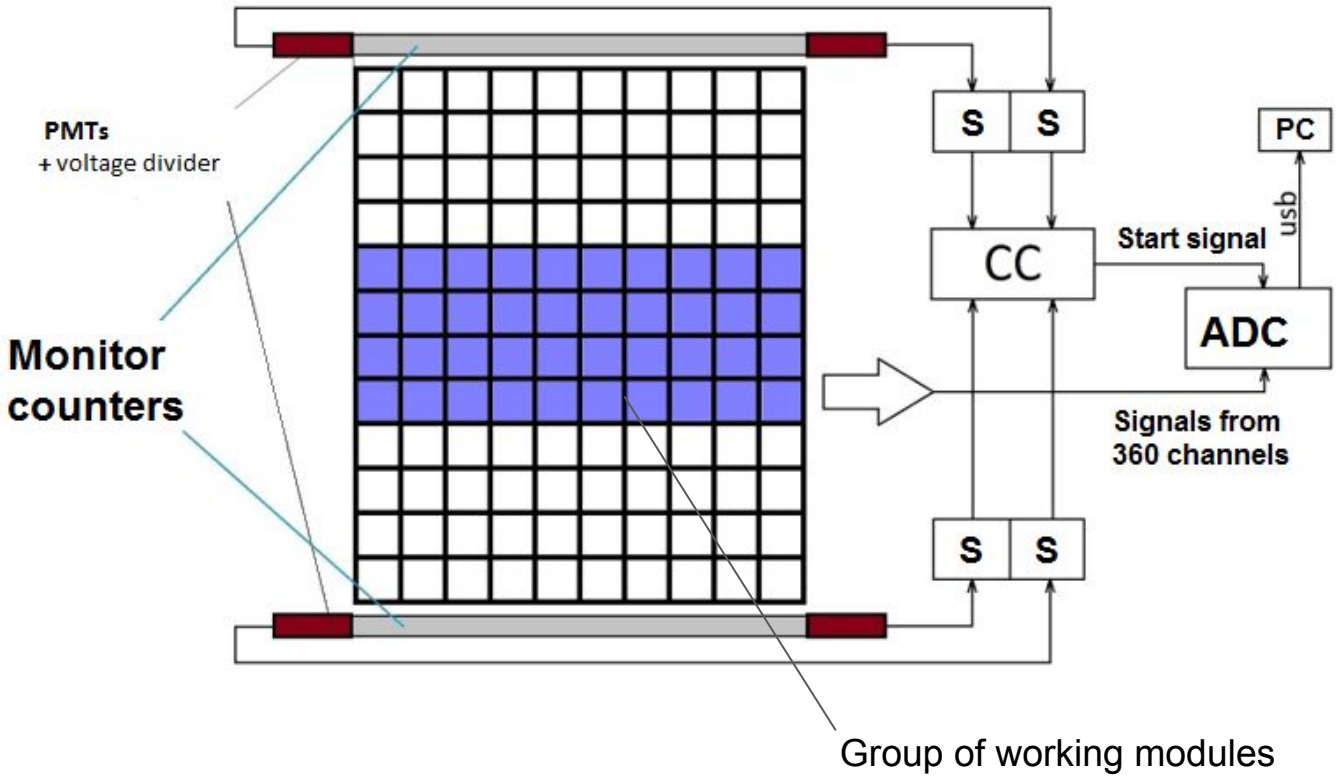
40 modules

360 cells

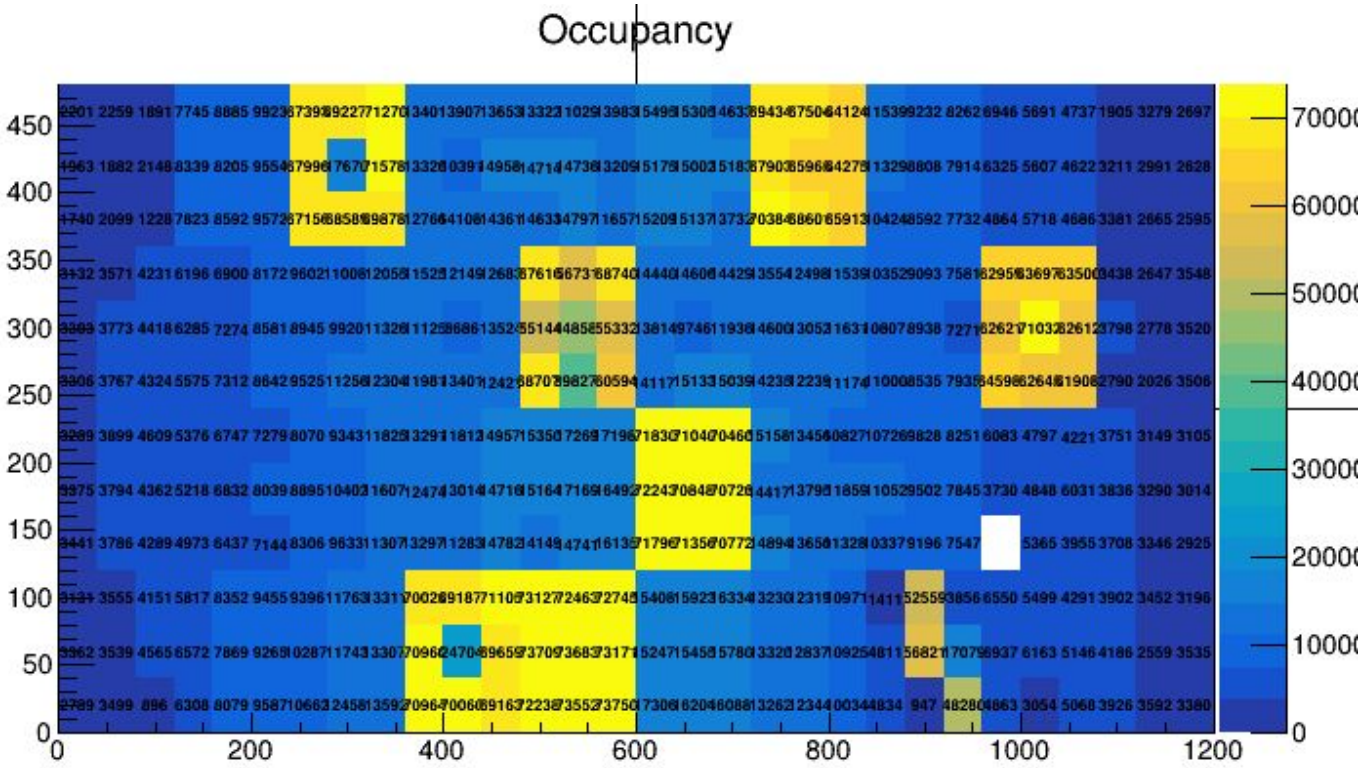
2 monitor counters

1200x480 mm

8 meters from target

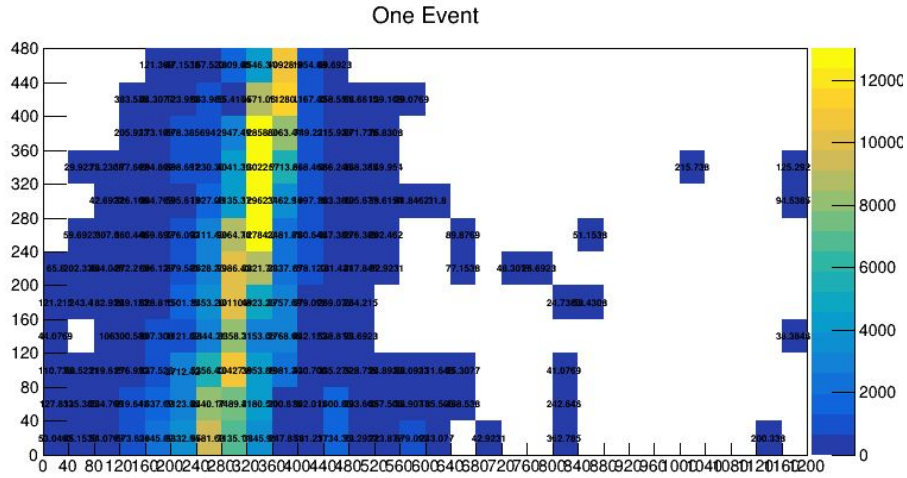


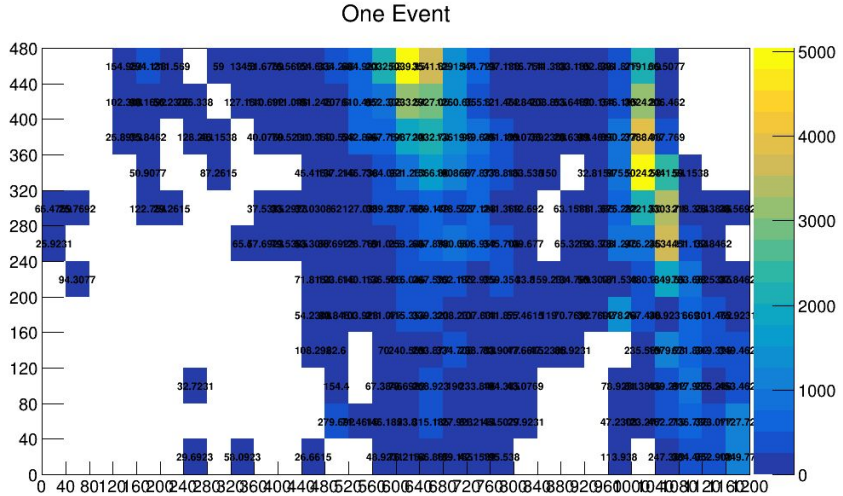
Data from cosmic rays

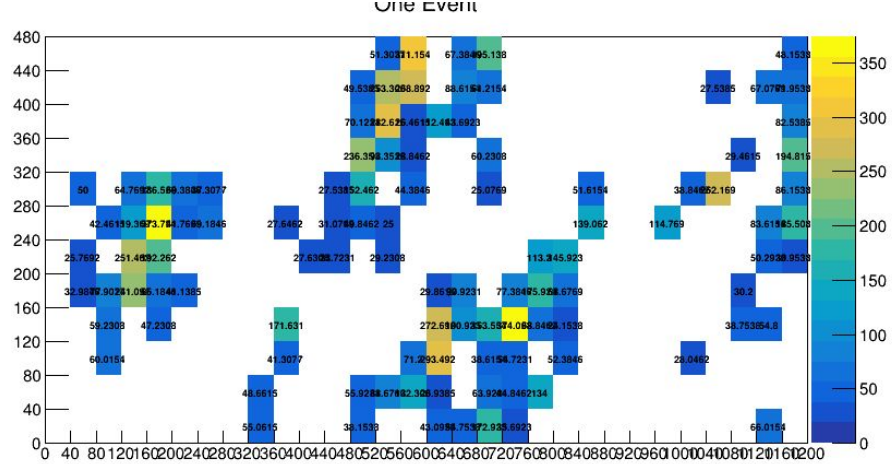


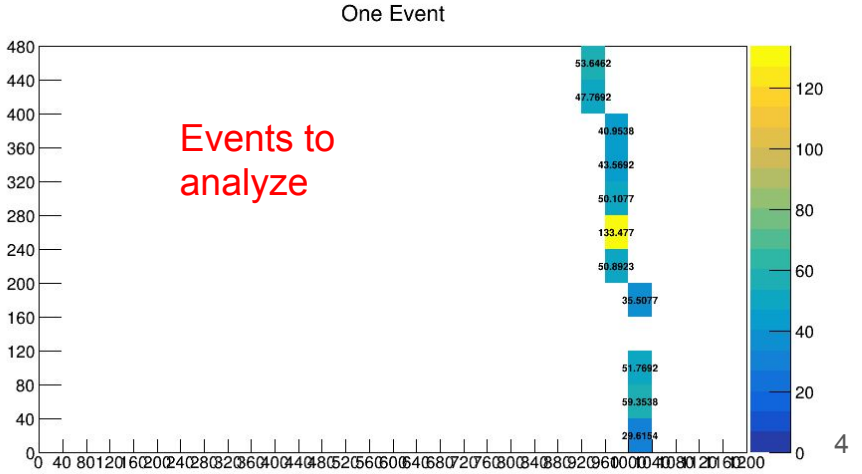
The LED signals was connected to 8 modules

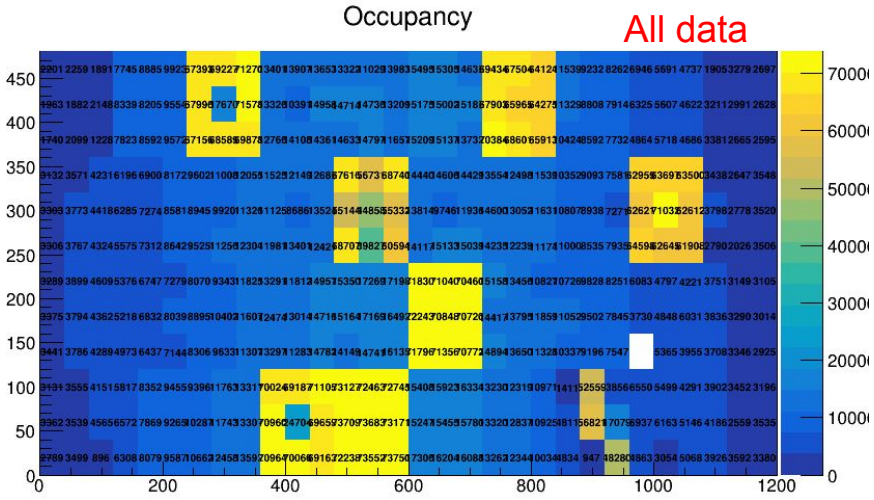
Events that are not considered in calibration

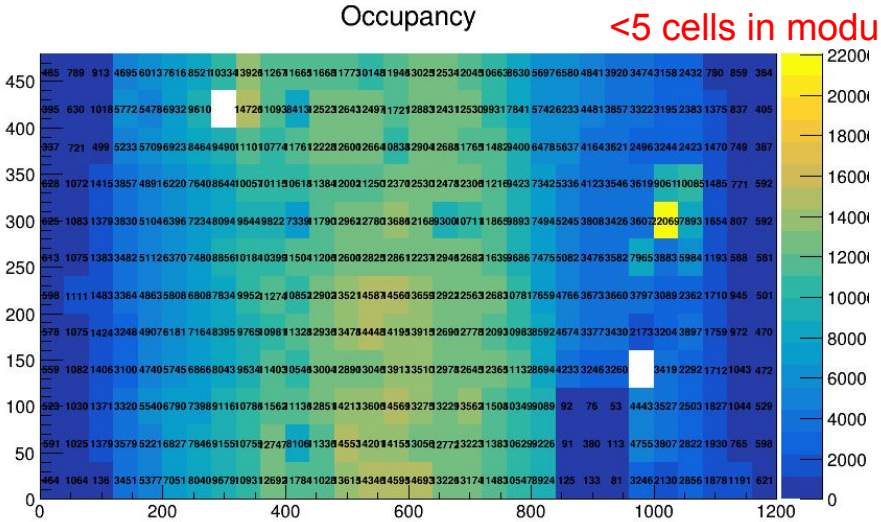


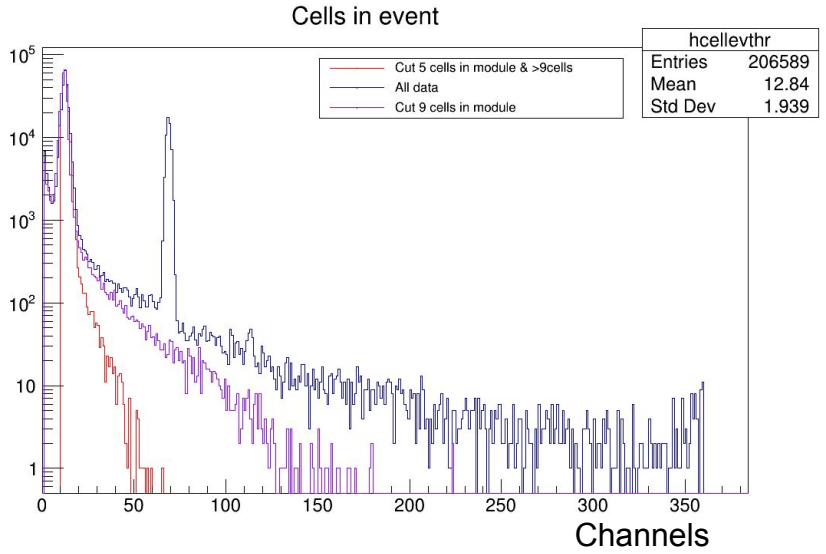










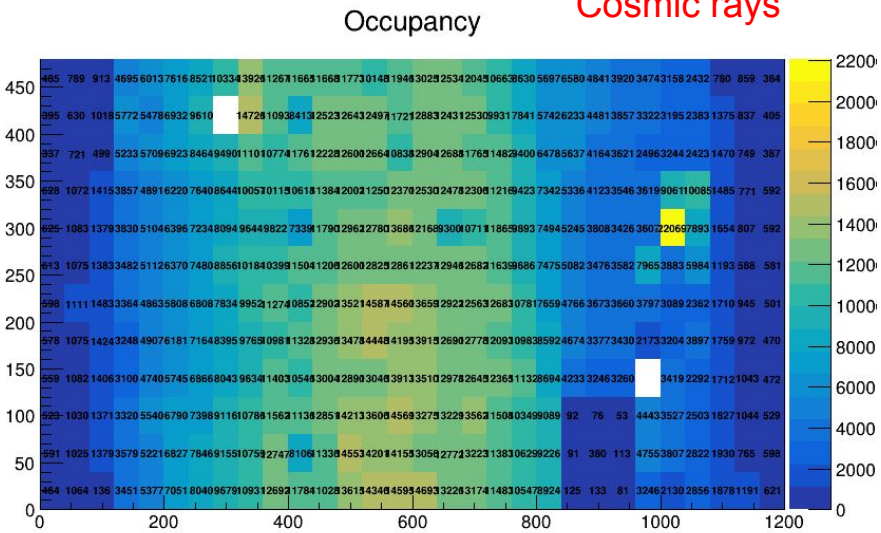


Cut:

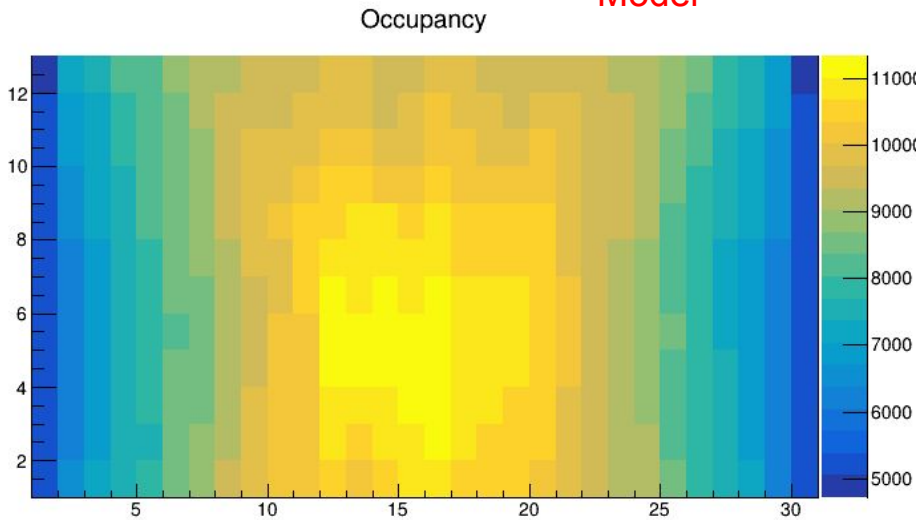
- Each module has less than 5 triggered cells
- More than 9 triggered cells in the event

Simulation

Cosmic rays



Model

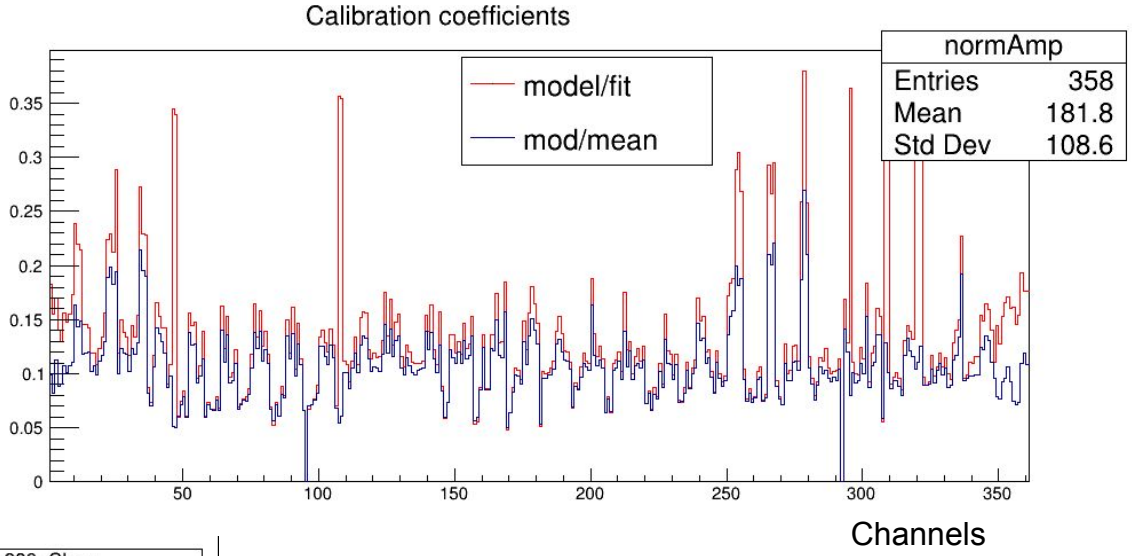


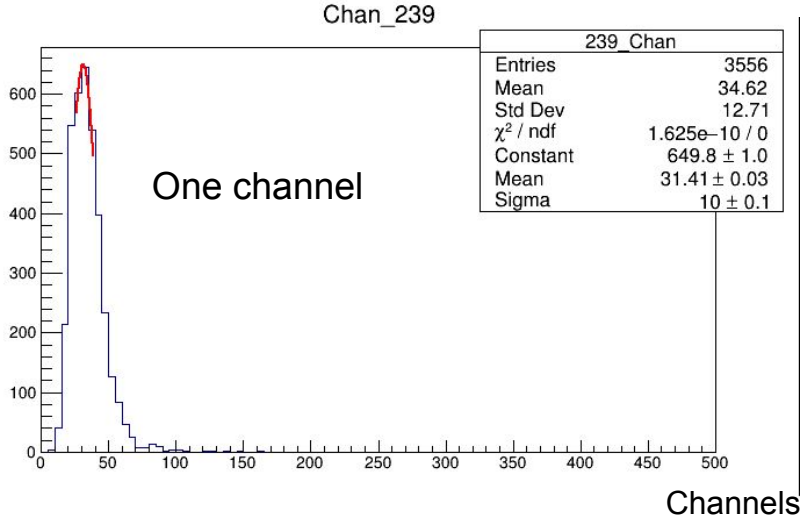
The coefficients for converting the signal amplitude into energy units for each calorimeter cell are obtained

Calibration coefficients

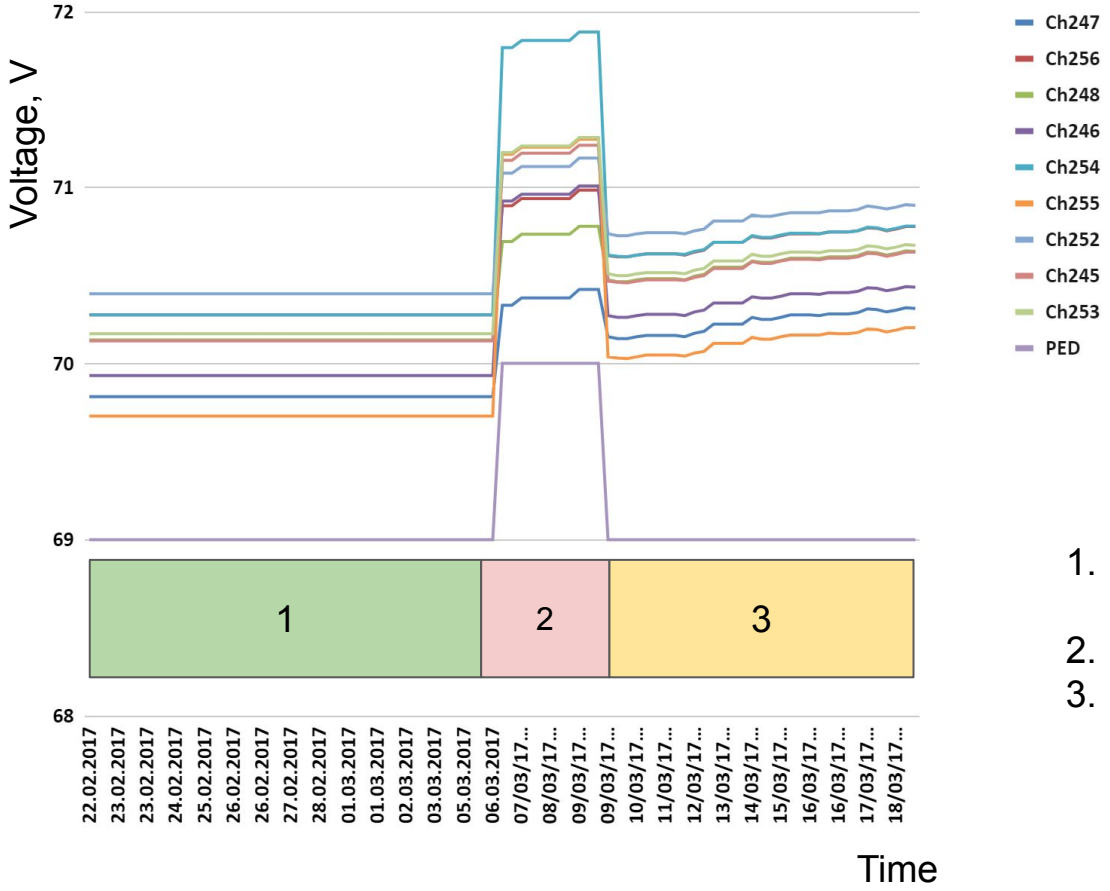
$K_c = K_m / A_f$

K_c - calibration coefficient
K_m - coefficient from simulation
A_f - fitted amplitude



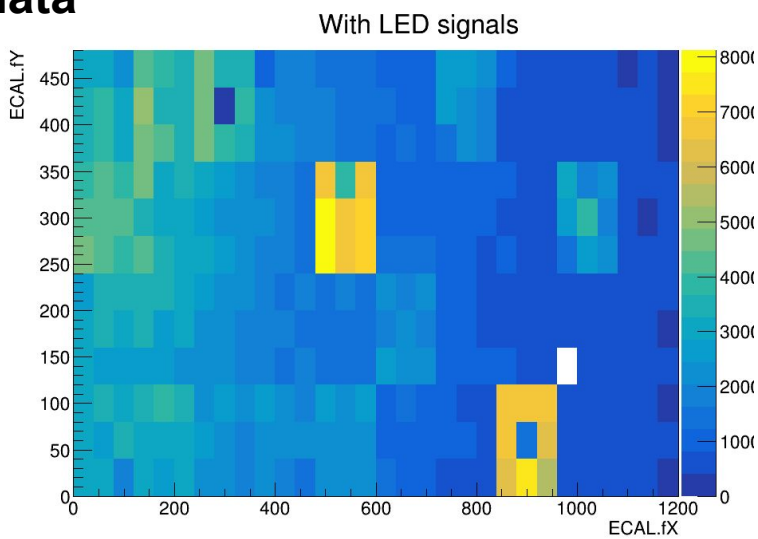


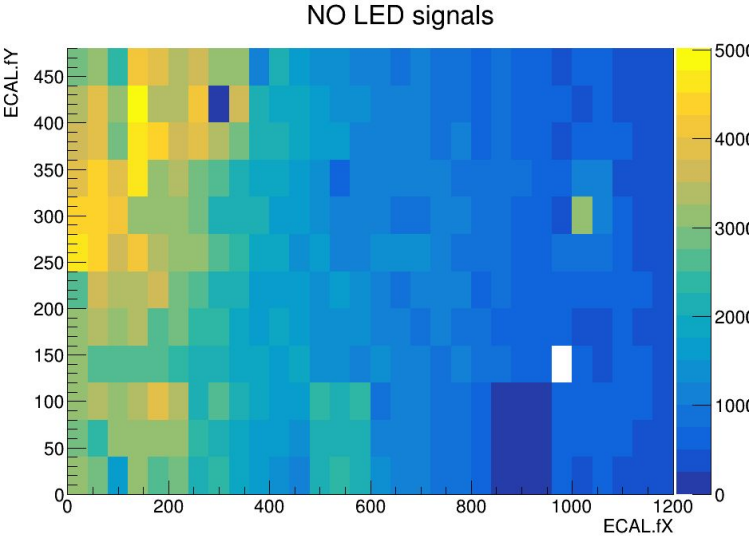
Example of voltage on one module for the entire period of run-6

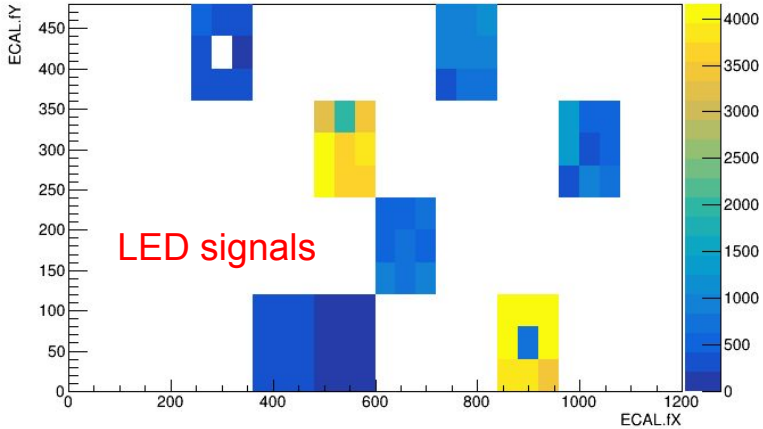


1. Cosmic data (Temperature compensation OFF)
2. Beam data with incorrect voltage
3. Beam data (Temperature compensation ON

Beam data

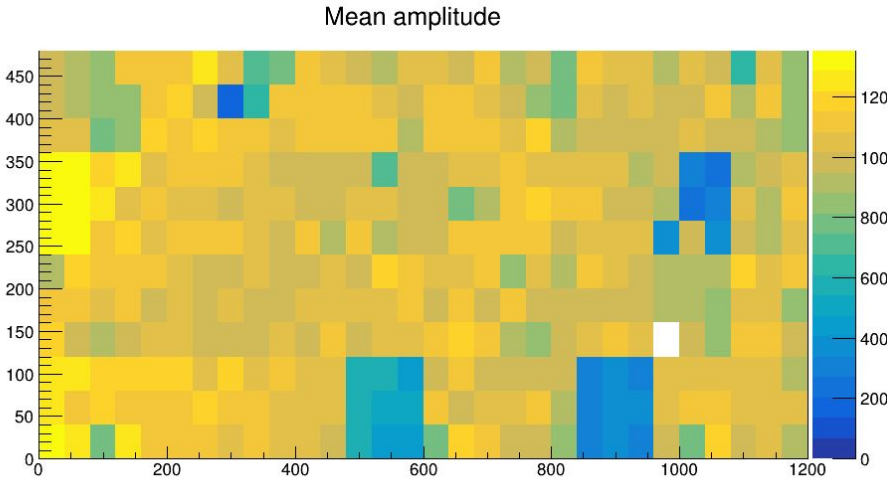

With LED signals
ECAL.fY
ECAL.fX

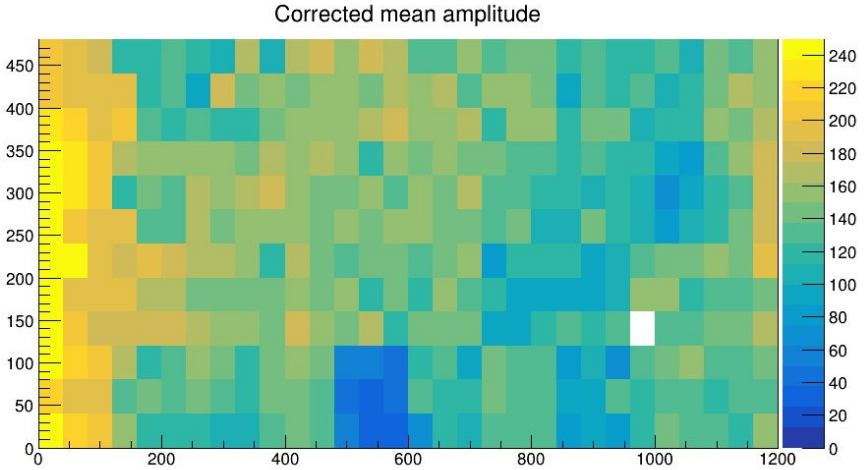

NO LED signals
ECAL.fY
ECAL.fX


LED signals
ECAL.fY
ECAL.fX

The application of calibrations

With coefficients





Conclusion

- The recorded ECal information was analyzed.
- Made matching the map file.
- Modules and individual cells with non-standard amplitude distributions are determined.
- Calibration coefficients were obtained for converting data received in the run-6.

To do:

- Fix problems in some modules and channels of the calorimeter associated with the operation of the high-voltage power system,
- Select files with a correctly functioning calorimeter for further analysis,
- Perform a physical analysis of the received data.
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Thank you for attention!