Investigation of the electromagnetic calorimeter response function by cosmic muons

Baldin ISHEPP XXIII, 2018

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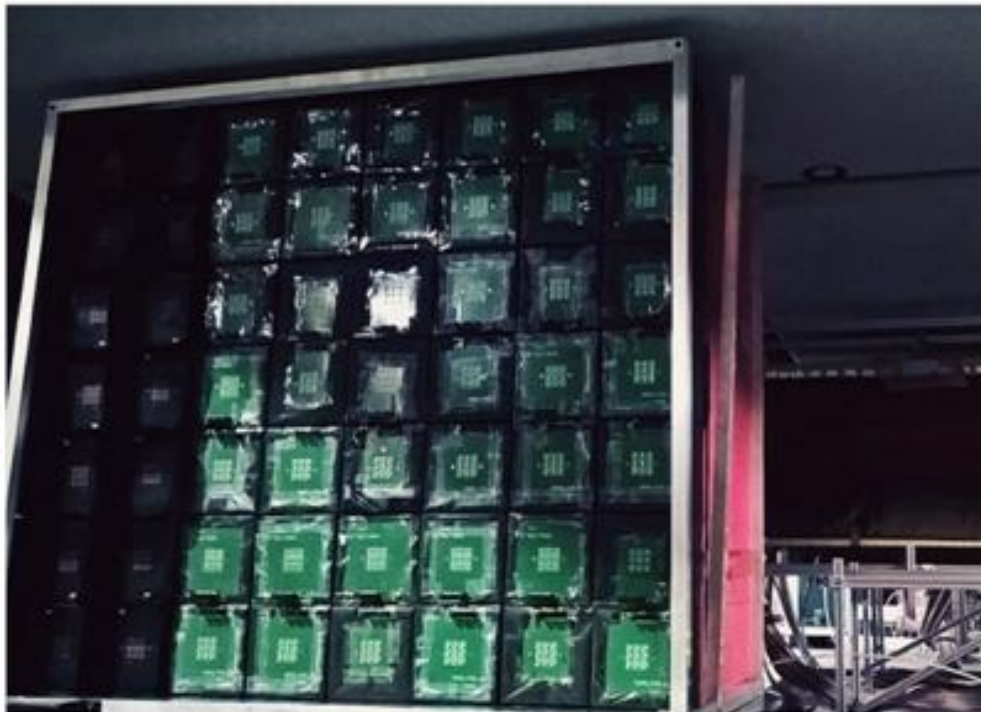[1]JINR, Dubna

[2]ITEP, Moscow

Plan

- Motivation
- Design
- Modeling
- Data analysis of the cosmic muons
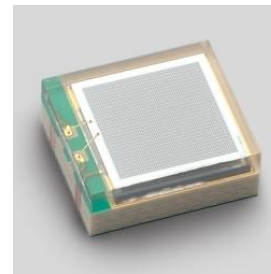- Calibration coefficients
- Calibration of beam data
- Conclusions

Motivation

The design of all installation

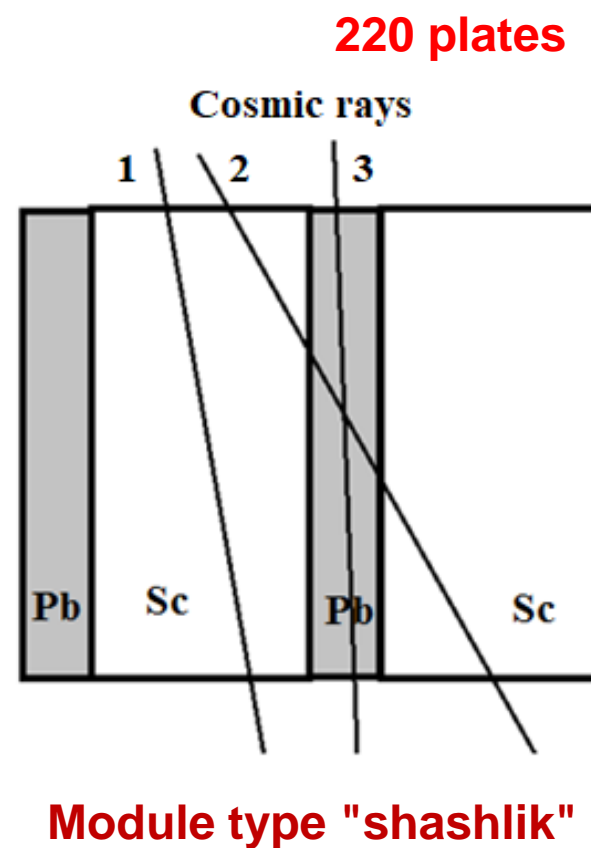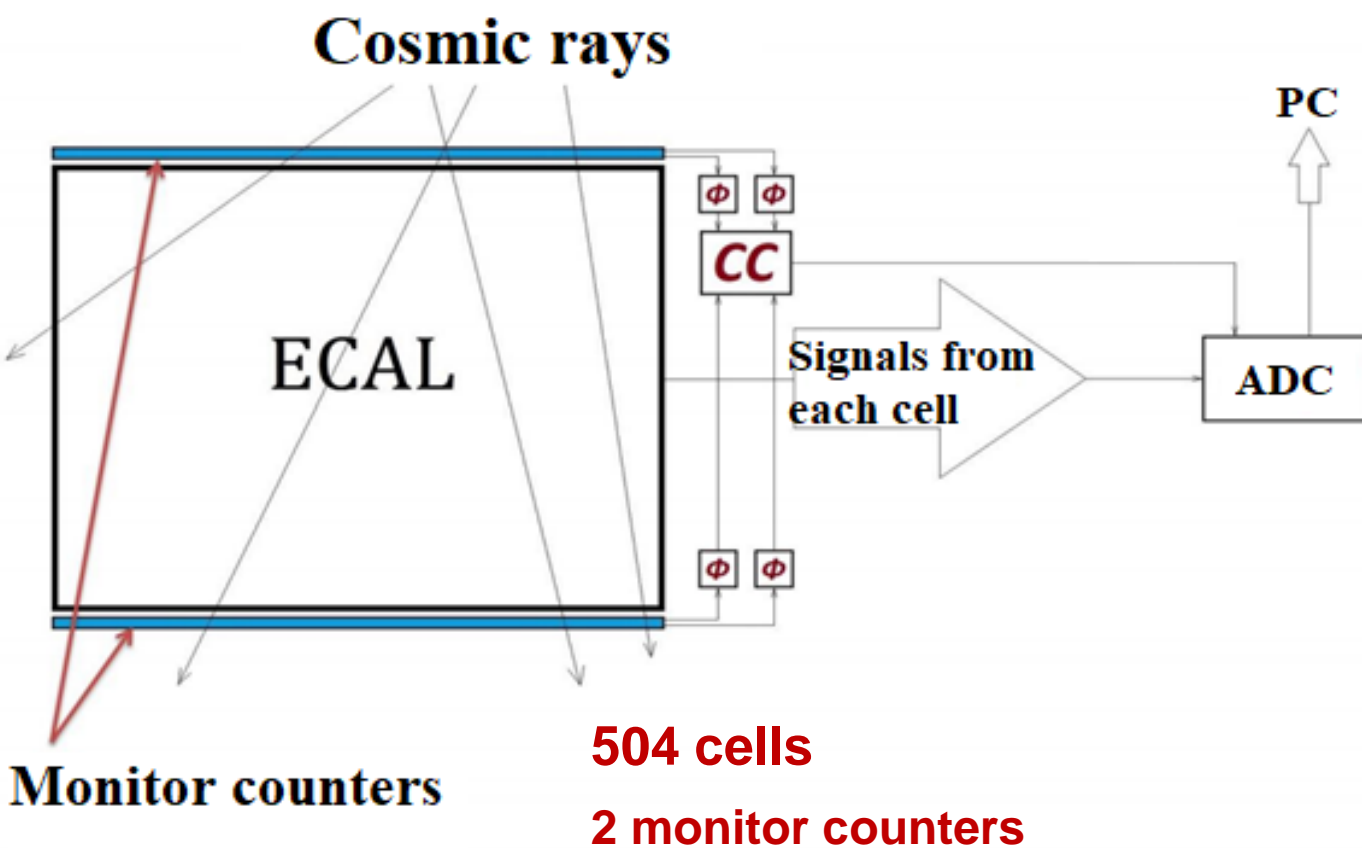**56 modules**

504 cells with MPPC
(Multi-Pixel Photon Counter)

ADC channels → **MeV**

Design

Cosmic rays

ECAL

Monitor counters

CC

Signals from each cell

ADC

PC

504 cells

2 monitor counters

220 plates

Cosmic rays

1   2   3

Pb   Sc   Pb   Sc

Module type "shashlik"
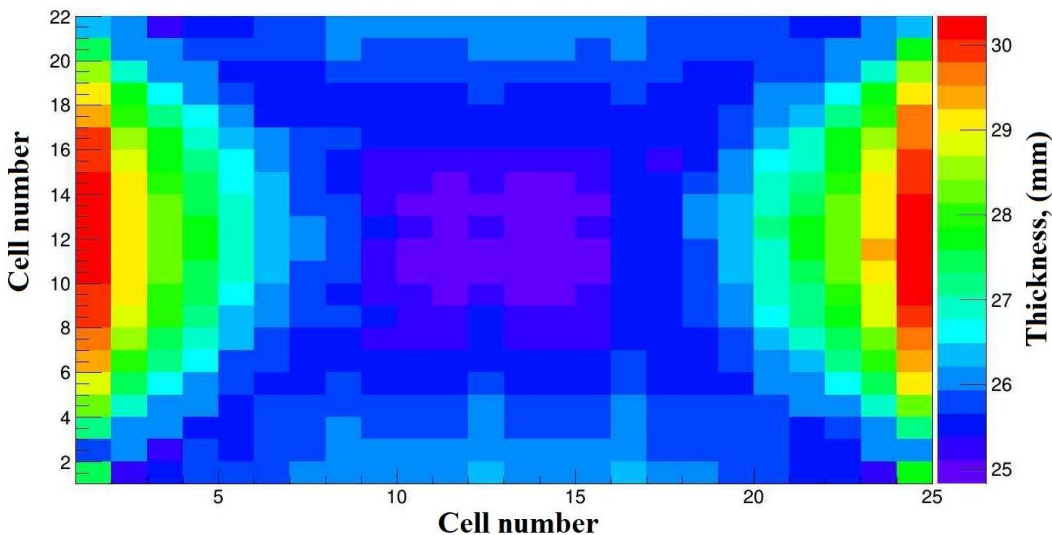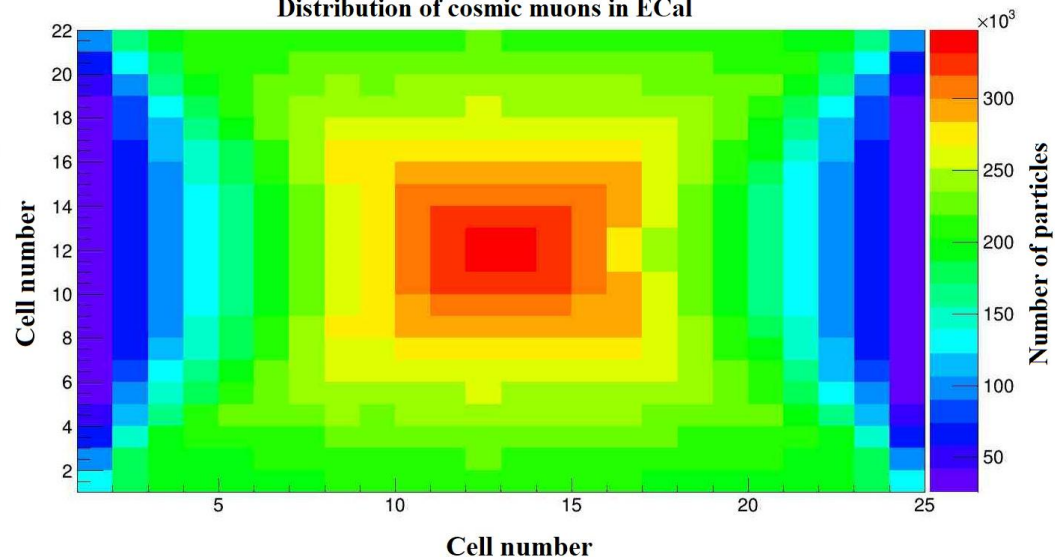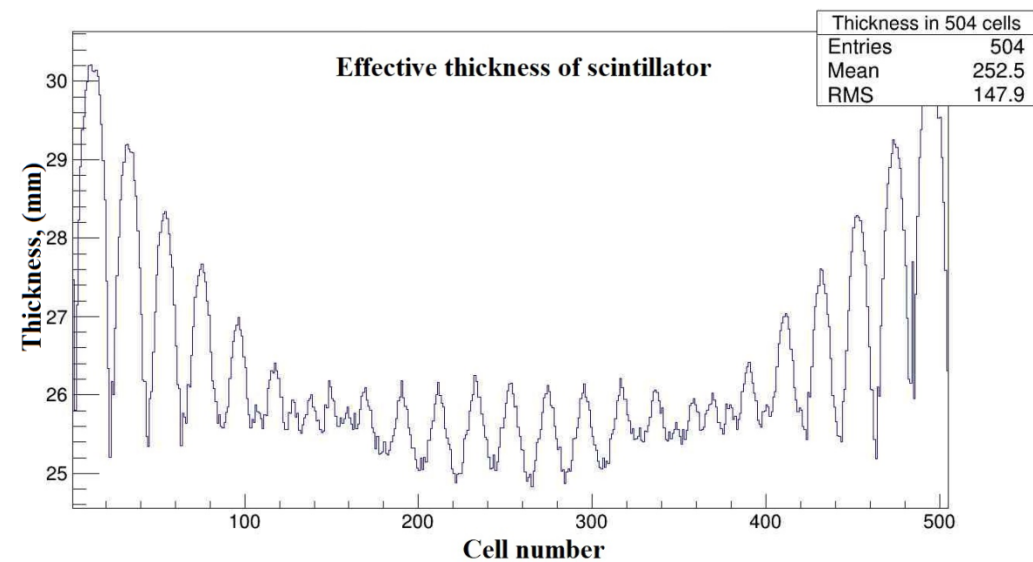
3

Modeling

The distribution of the effective thickness of the scintillator in ECal

Distribution of cosmic muons in ECal

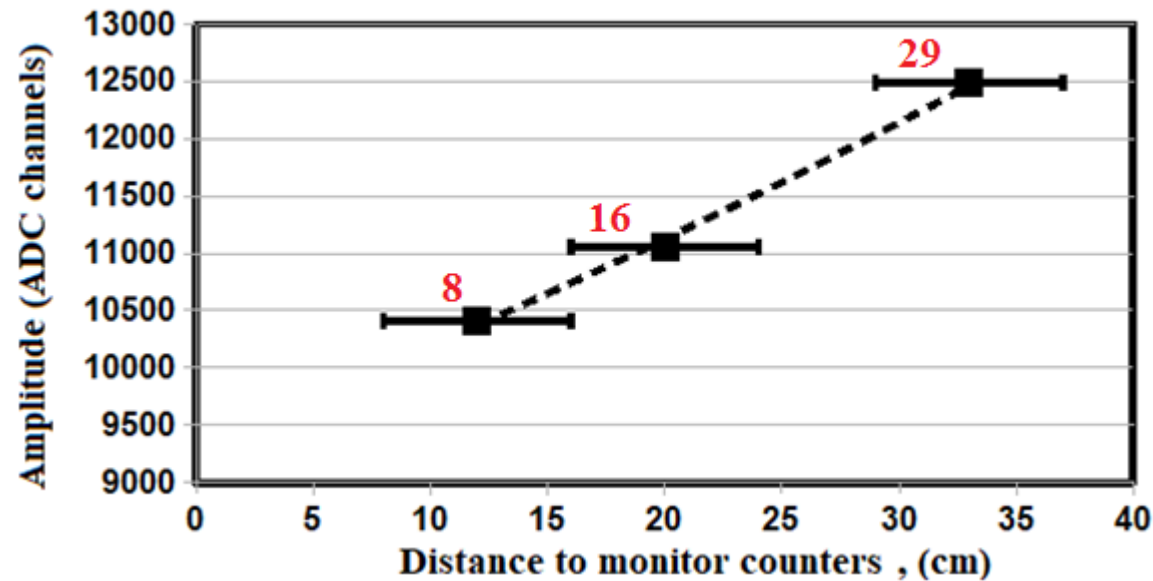Effective thickness of scintillator

Thickness in 504 cells	
Entries	504
Mean	252.5
RMS	147.9

Average energy

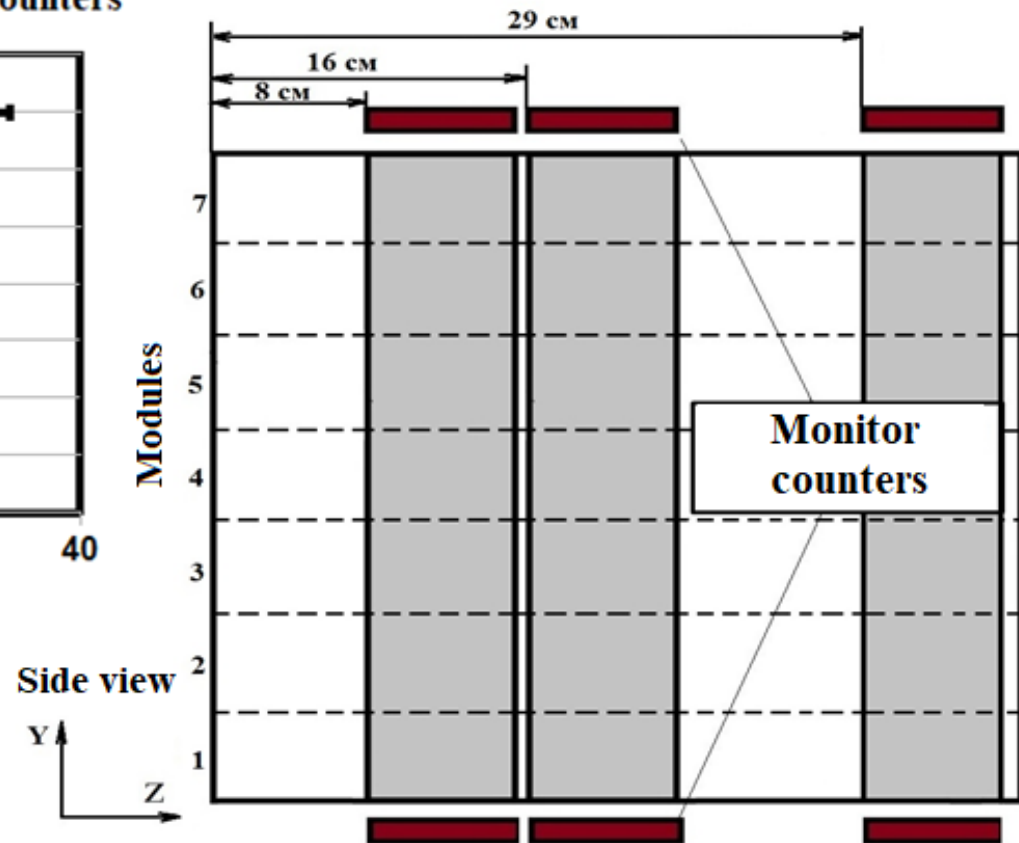| Average energy in 504 cells	
Entries	504
Mean	5.263
RMS	0.2511
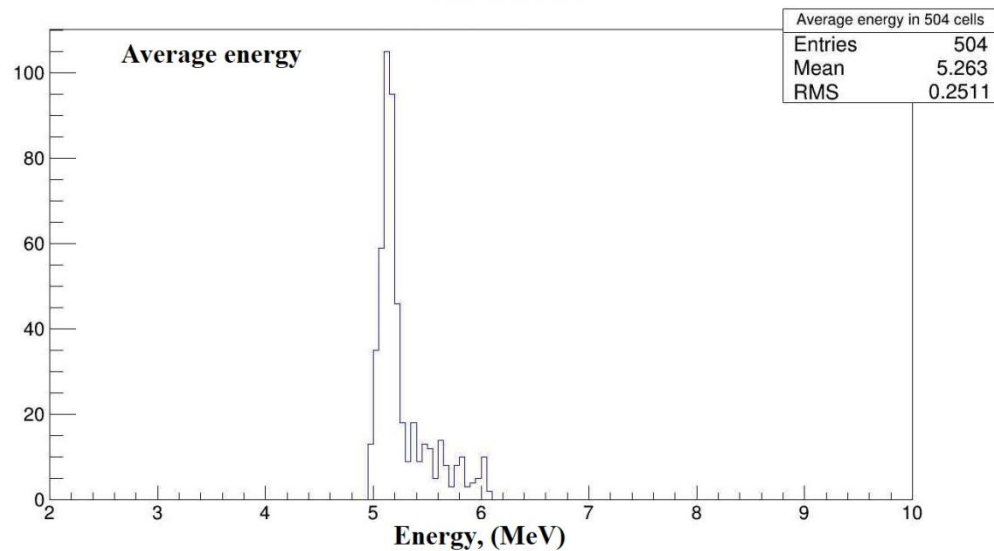
Data analysis of the cosmic

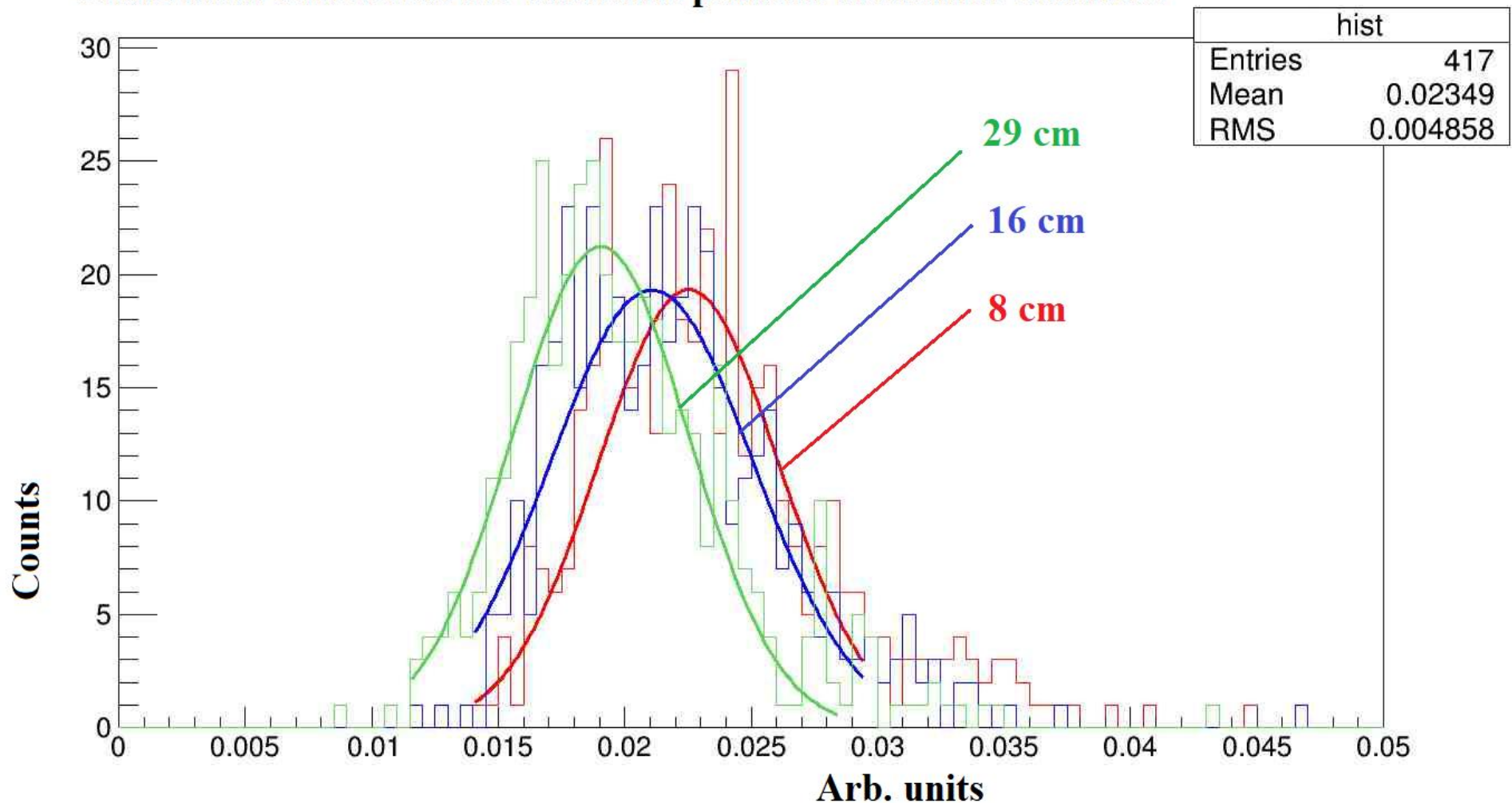
Dependence of total amplitude on distance to monitor counters

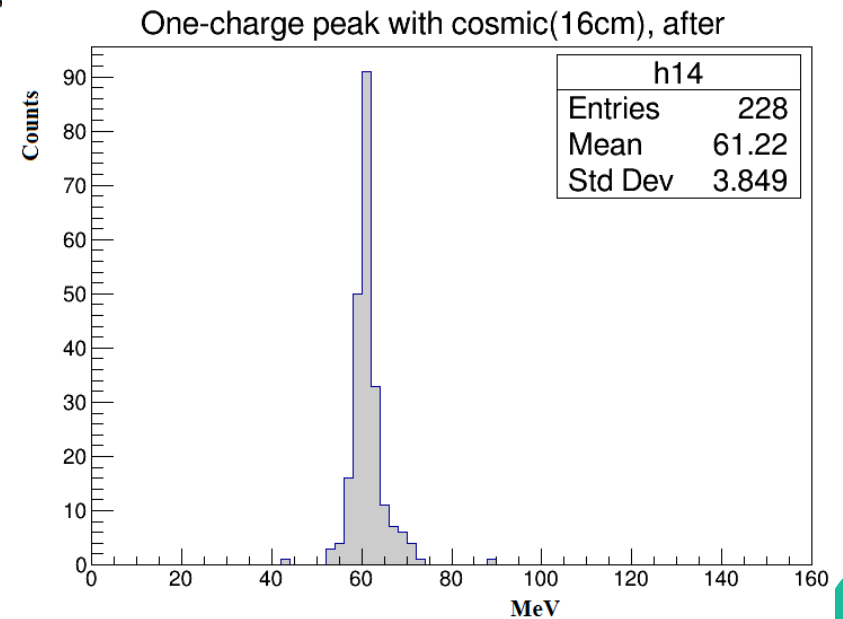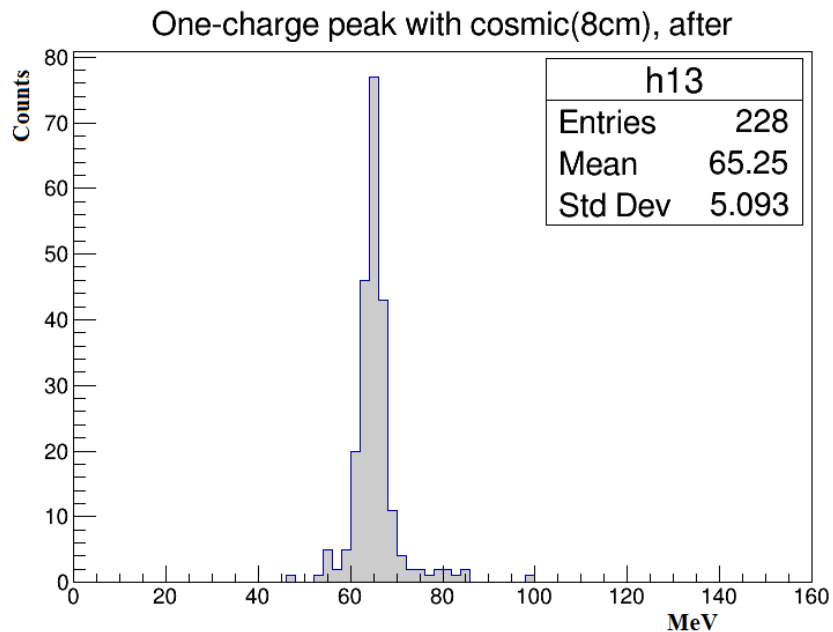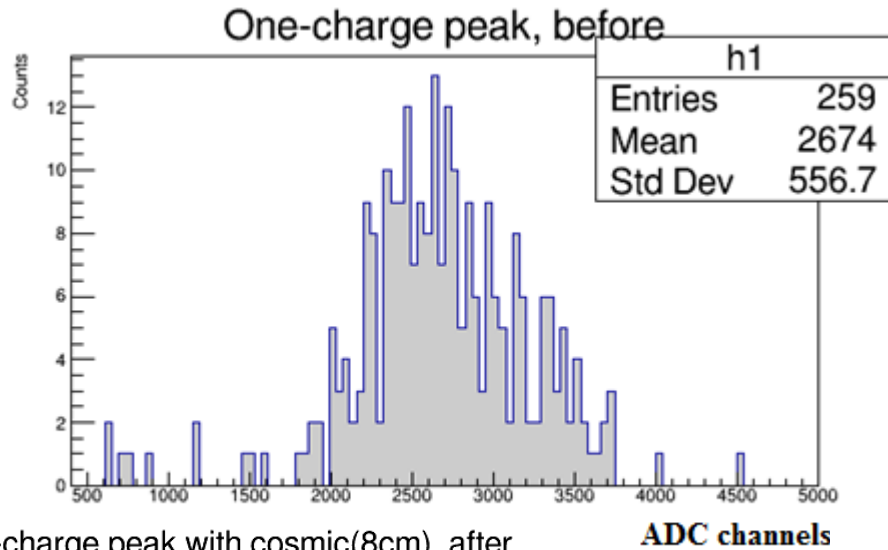From **opposite** side of the electronics

Calibration coefficients

Calibration coefficents for differents position of monitor counters

Calibration of beam data

Conclusion

The obtained modeling data play an integral role in the analysis data collected during the exposure of the electromagnetic calorimeter on cosmic muons.

And now it's used to analyze the processing of experimental data obtained in the interaction of carbon, argon and krypton at an energy of 3.5 GeV/nucleon with different targets.

Thank you for attention !

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