Educational Alibava System

ALIBAVA
SYSTEMS

Educational Alibaya System

EASy

01 Overview

EASy is a portable, compact and complete system for microstrip sensor characterization that uses the front-end readout Beetle chip developed for CERN/LHC experiments.

EASy is a plug-and-play educational system based on the Alibava System. All components needed to start measuring are assembled and prepared, including the microstrip sensor. **EASY** allows for a quick and simple setup, ideal for student laboratory experiments. Furthermore, a practical exercise book is included.

The system introduces high-energy physics and particle detectors to physics students with hands-on experience. It familiarizes the students with concepts such as MIP, charge deposition, full depletion and interstrip pitch among others.

02 Features

- P-on-N microstrip silicon detector.
- 128 channels.
- Function modes: Electronic calibration, radiation source and laser.
- Laser source with positioning and focusing system.
- Chip BEETLE at 40 MHz.
- Energy resolution: 3 to 6 KeV.
- Energy range: up to 330 KeV.
- Three different trigger modes.
- Connectivity USB 2.0.
- Acquisition software for Windows, Linux and Mac.
- Data stored in custom binary and HDF5 files.
- Example macros for further in-depth analysis provided.
- Voltage supply: +5 V.

The System

03 Control Unit

Control Unit

- Processing of the sensor data, trigger signals and laser source.
- Control of the acquisition process.
- Adjustable HV unit for microstrip sensor, with voltage and current display.
- Communication with computer software via USB.
- Size: 170x125x55 mm^3

Sensor Unit

- Microstrip detector.
- Beetle chip:

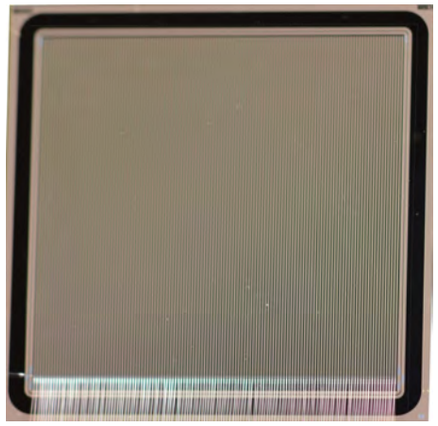
- Low noise ASIC developed for CERN/LHC experiments.

- 128 channels.

- Clock speed 40MHz.

- Opaque carbon window to place radioactive source.
- Laser micropositioner and focus system.
- Size: 190x108x140 mm^3.

05 Microstrip Detector and Laser Source



Microstrip Detector

- Size: 20x20 mm^2
- Thickness: 300 µm
- Channels: 128
- Interstrip pitch: 160 µm
- Full depletion $V_{FD} < 60$ V
- Break down V_{BD}: > 300 V
- Reverse current I_L (@60V) < 10 nA/strip
- Bias adjustable from control unit.

Laser Source

- Wavelength: 980nm
- Pulse width: 5 ns
- Laser Spot: 20 µm
- Micropositioner resolution: 10 µm

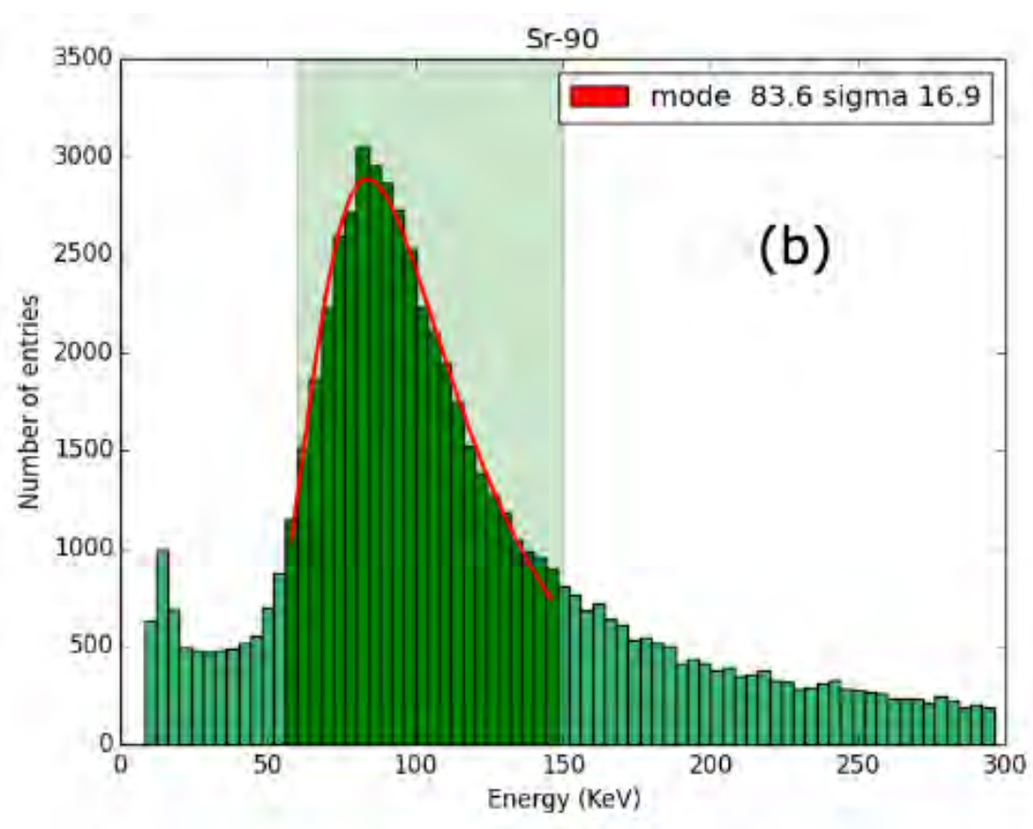
Timing and Trigger Modes

- Time stamp register for individual events.
- Three trigger options:

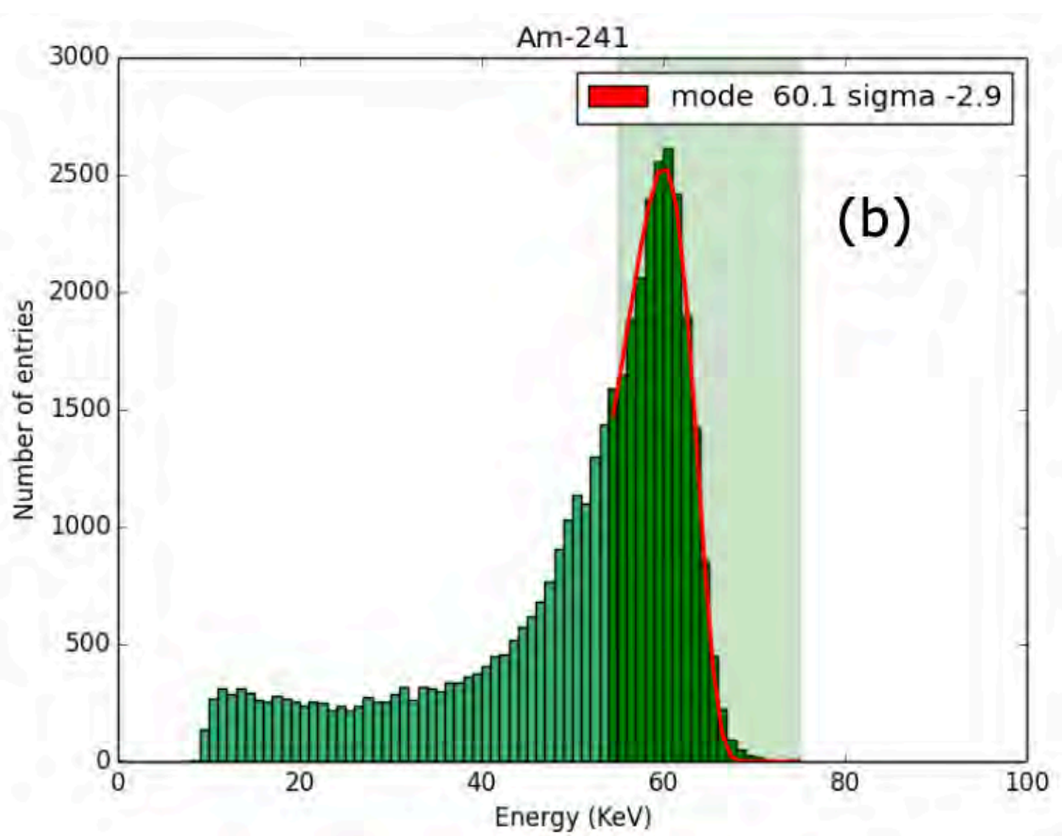
- External: Triggered by diode detector included.

- Autotrigger: Beetle generated trigger for particles absorbed in the microstrip sensor.

- Synchronised trigger: triggered with laser source.

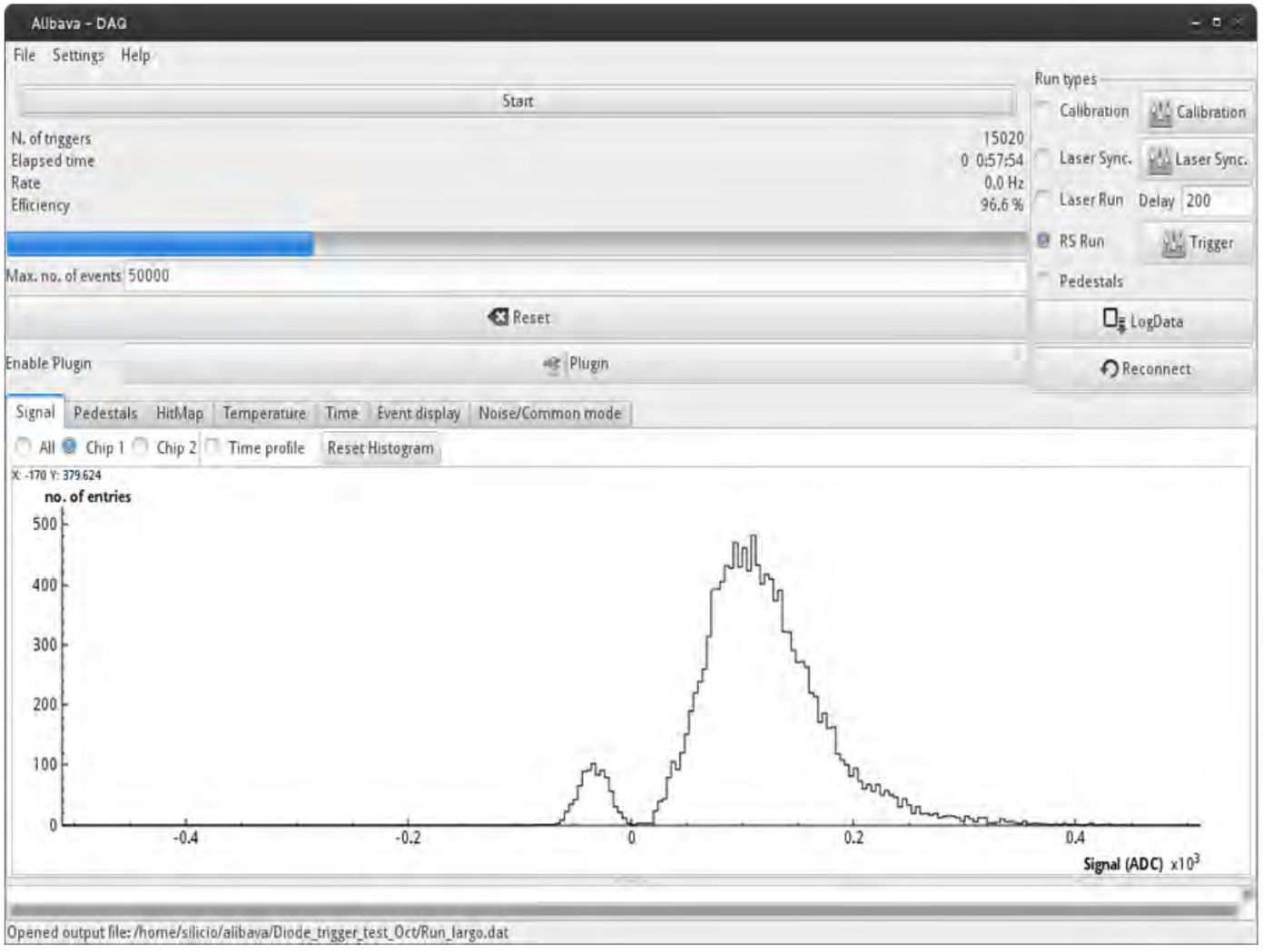


Diode Trigger



Auto Trigger

07 Acquisition Software



Acquisition Software

Simplified software controlled by GUI to ease the control of the system. Data provided: noise, gain, pulse shape, collected charge, single events per channel and more. Results stored in binary and HDF5 files. Example analysis software (macro) in ROOT, Python, Matlab and Octave. Students can program further.

Would you like to be the next using EASy?

08 Contact Us

For more information about the **EASy Educational Alibava System** please contact us:

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