Tanca Data Acquisition

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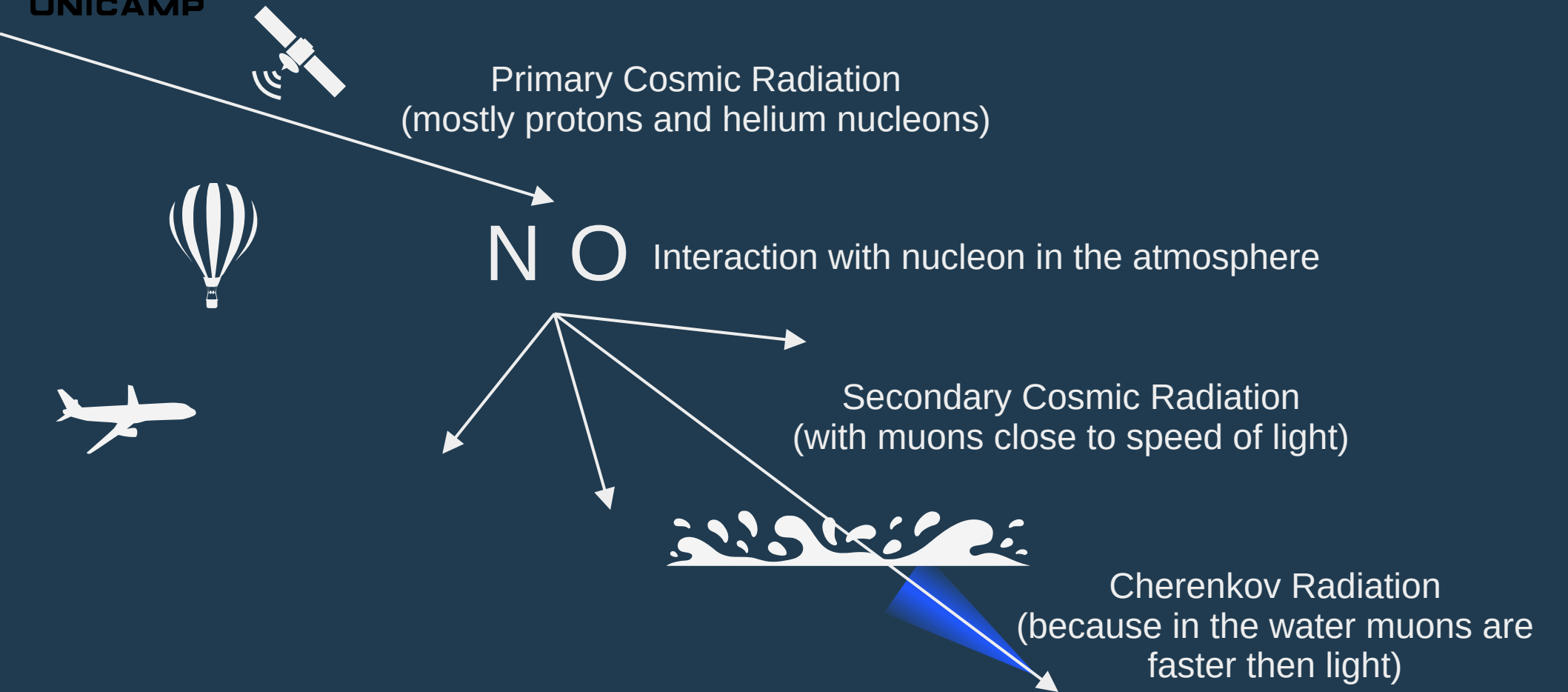
Muons and Cherenkov Rad.



Measurement of Cherenkov Rad.

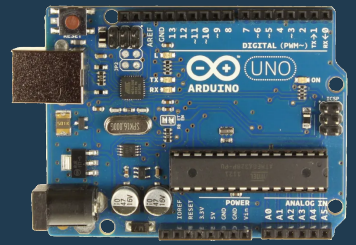
Collecting data from
3 Photomultipliers

Digitizer:
CAEN DT5720B

Running the
Tanca Data Acquisition
program

LabBook

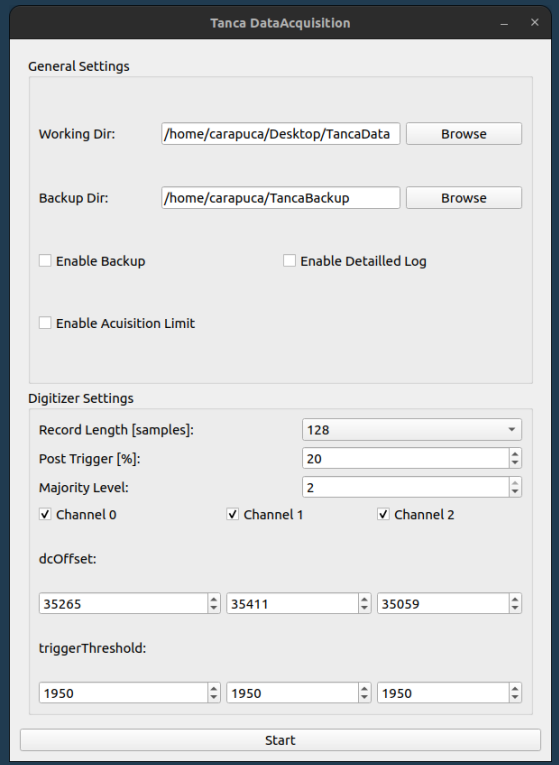
Collecting data from
environmental sensors



Arduino:
Arduino UNO

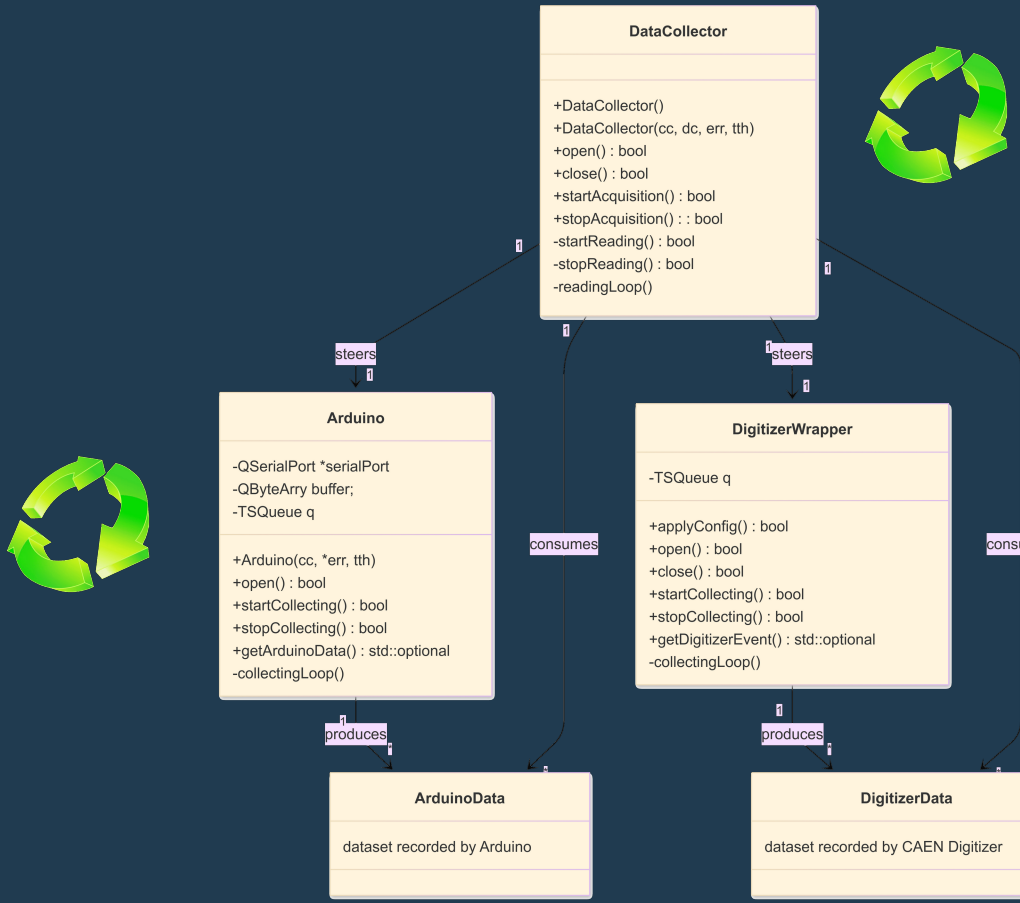
UNICAMP

Tanca Data Acquisition program



- Code written in C++
- Based on the CAEN C libary
- GUI written in Qt for C++
- Configure the CAEN Digitizer
- Set Acquisition Settings
- Start and Stop Acquisition

Data Acquisition Code



Collecting in loop from Queue and write data in root files

Collecting on ReadyRead by Qt slot and add to Queue

Collecting in loop in own thread and add to Queue

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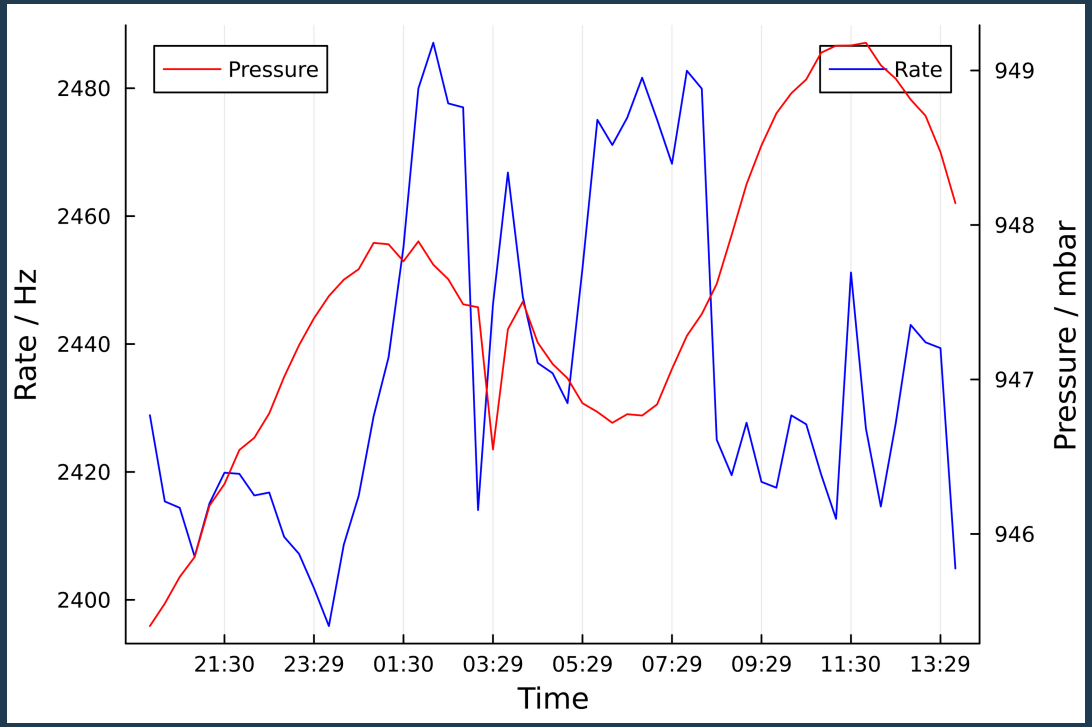
Analysing The Data

- **High performance:** Just-in-time (JIT) compiled, often as fast as C.
- **Easy syntax:** High-level and expressive, like Python or MATLAB.
- **Built-in parallelism:** Supports multi-threading and distributed computing.
- **Efficient memory handling:** Designed for large arrays and numerical data.
- **Rich ecosystem:** Libraries for data analysis, statistics, machine learning.

Analysing Rate and pATM




```
readData(workingDir::String,
parts::Int)
```

Reads all the root Data created by the TancaDataAcquisition program from one woking directory.

Arguments

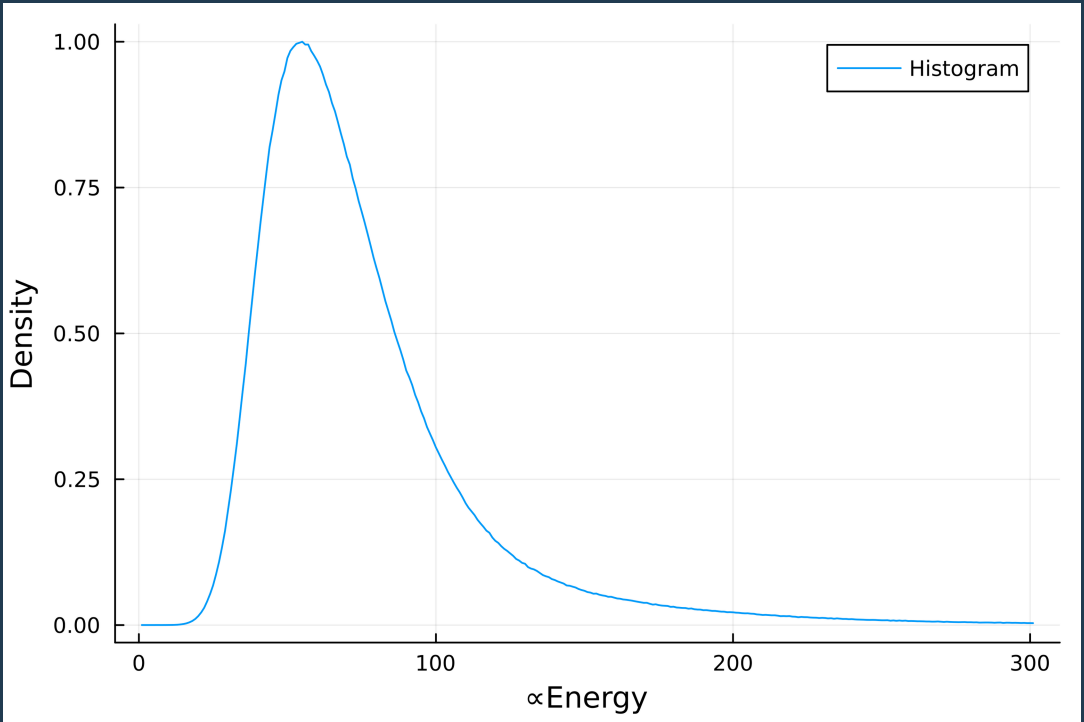
- workingDir::String
  folder of all root-Files
- parts::Int
  Number of Parts each hour is devided in for mean values

Output

- StructArrays(containerData2)
- StructArrays(containerData3)

  Returns List of Spectrums, one for every hour.

Analysing Spectrum



`getSpectrum(workingDir::String)`

Returns List of Spectrums, one for every hour.

Arguments:

- workingDir::String
  folder of all root-Files
- bins::Int
  Number of bins for the Spectrum

Output:

- Array(Histogram)