JuroCalib
Energy calibration program for germanium array

Joonas Ojala

April 22, 2019

1 Foreword

This energy calibration program has been done to help in energy calibration for germanium arrays at Accelerator laboratory of Jyvskyl. The program has been tested with data from of JUROGAMII , JUROGAMIII and conversion electrons from the Sage silicon detector with success!

2 Getting started

JuroCalib run with Python3.6 including Numpy (Tested with 1.14.4) and Scipy (Tested with 1.1.0) packages. User need to install these packages! User can insert program folder in path of their desire. For example:
~/energyCalibration=<PATH>
The program folder has inside following folders:
-Source: Contains program itself.This folder should contains following files files:energyCalibProgram.py, energyCalibration.py, gaussianFit.py, guiCommand.py, peakSearch.py, rawCalibration.py, readEnergies.py, readGUIFile.py,readOutput.py, readSettings.py.
-Input: Default folder for input spectrum which user wants to calibrate.
-Output: Default folder for output which are created by program.
-CalibrationFiles: Contains files of peak energies which user want to use for calibration. The mixed source Eu-152 and Ba-133 is there as default (Euba.txt). One can find the format of calibration file from appendix A

3 Starting Calibration

The easiest way to start the program goes as follows:
cd <PATH>/Source/
python3.6 energyCalibProgram.py
This should open GUI (Graphical Unit Interface) of program which is shown

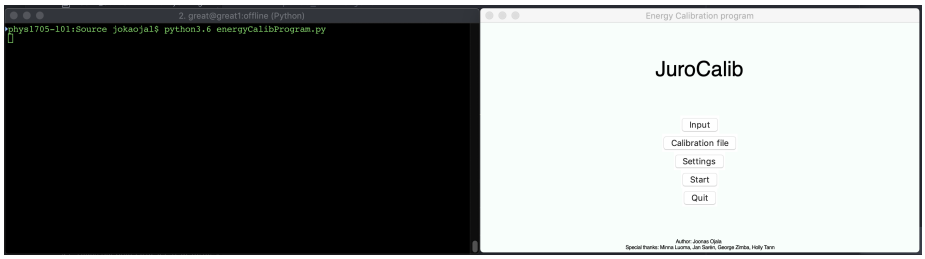

Figure 1: One can see the commands to open GUI and GUI itself. Here one can see all the tabs which basically define the inputs before one can start calibration.

in figure Before starting the calibration, following objects need to be defined: location of input data, location of output folder location, calibration energy file (either location of user defined energy calibration file or default Eu-152 and Ba-133) and settings for peak search. In these instruction will follow step by step, how to proceed to calibration.
First User defines the input.

Appendix A Eu-152 and Ba-133 calibration file

#Peaks on a table
#Peak energies unit in keV. If user want to use same energy difference in high and low energy,write the energy difference in Energy_low #Energy,Energy_low(or Energy_difference),(Energy_high)
*#The *-marked energies are used as a first selection in rawCalibration.py*
80.997,3
*121.7825,3,**
244.6989,3
276.398,3
302.853,3
344.281,3,2
356.017,2,3
383.851,3
411.115,3
443.965,3
510.999,3
*778.903,3,**
867.390,3
964.055,3
1112.087,3
1408.022,3