MIMOSIS Characterization Software

September 30, 2024

1 Introduction

Comments by Roma Bugiel:

- For laboratory characterization runs the data format will not change, clustering decoding will be done in the DAQ SW.
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Characterization for MIMOSIS-1:

- Create a workspace (folder) named "Mimosis_Characterization"
  - mkdir Mimosis_Characterization
  - cd Mimosis_Characterization
- Create a folder for the input data and a txt file for run list.
  - mkdir inputData
  - touch run_list.txt
- Get some data from the server
  - scp -r username@sbgli2:/work/picsel/rawcmos100/data/DATA_Laboratory/Mimosis_1/Chip21/run_21219 .
- Clone repositories (forked from RomaBugiel/MIMOSIS1_PhysicsAnalysis_unix)
  - https://github.com/AltingunAli/MIMOSIS1_DataConverter_unix
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- MIMOSIS1_DataConverter_unix: it is a macro needed for changing .dat format (output of DAQ) into ROOT files
- MIMOSIS1_PhysicsAnalysis_unix: it is a macro that makes S-curves, calculates thresholds and so on
- compile (starting from to Mimosis_Characterization directory)
  - make -j12
  - cd ..
  - cd MIMOSIS1_PhysicsAnalysis_unix
  - make -j12

- Modify run_list.txt in Mimosis_Characterization folder (you can find and example in MIMOSIS1_PhysicsAnalysis_unix folder).
  - Run_No : Run number
  - Chip No : Chip number
  - Matrix : Matrix of interest (A, B, C, D)
  - HV : High Voltage
  - BB : Backbias voltage
  - VCASN2 : VCASN2 value
  - VCLIP : VCLIP value
  - VPL : VPL value
  - VPH : VPH value
  - INPUT[e] : Input value in e
  - Step size : Size of one step (in general it is 5)
  - Nb steps: Total number of steps
  - VCASN: VCASN in DAC
  - VCASN[mV] : VCASN in mV, (not used at the moment) can be set to 0
  - Row_Start : The First pixel row to start
  - Row_End : The pixel row to end
  - Clean_Plot : If you require clean and well-organized S-curve plots, set the value to 1; otherwise, set it to 0. While the results improve when set to 1, the overall change is not significant.
  - VPH_Fine[mV]: VPH fine value in mV.
- Please check the LogFile.txt for any changes made to Roma's version.
- cd MIMOSIS1_DataConverter_unix
- ./run_all.sh ../run_list.txt
- cd ../MIMOSIS1_PhysicsAnalysis_unix
- ./run_all.sh ../run_list.txt
- The analysis is done at this point.
- Results:
  - MIMOSIS1_PhysicsAnalysis_unix folder, output_results.txt: you can copy the results from here and paste into https://sbgpicselpcb.in2p3.fr. You can also find a text file named Results.txt in the outputData folder located in MIMOSIS1_PhysicsAnalysis_unix, which makes copying the results to the website easier and faster.
  - In the output_results.txt, there is a "respond" column. It means how much pixel in % have S-curve fitted. If low %, it means that data has been take with wrong VPH-VPL or just something is not good with this run.
  - for each run MIMOSIS1_PhysicsAnalysis_unix/outputData there are control plot stored. Have a look on h2_mu especially, which is a 2D map of thresholds. You will see if there are some dead rows, columns, patterns and so on. Similar plot for noise is stored.