

From the electric pulse to image quality - the analysis chain of imaging detectors (exercise consultation)

Tuesday 29 September 2020 16:35 (30 minutes)

Imaging gaseous detectors are the base-technology for many applications, such like Medical Imaging and Airport Security, as they are an upgrade to our biologic eyes.

The objective of this lecture is to join physics and computing concepts to fully understand the analysis chain of an imaging gaseous detector. We will discuss the physics inside the detector, the engineering that processes the electric pulses, the computing skills behind image reconstruction and come back to the physical concepts by extracting meaningful parameters from the final image.

In the exercise session, you will follow these steps yourself by analyzing electric pulses from an oscilloscope, reconstructing an image from a data file and quantifying some important parameters like position resolution and noise.

Exercise instructions:

1. Download the Exercises_files.zip and extract the files
2. Upload files to SWAN (<https://swan.cern.ch>) for CERN users or Google Colab (<https://colab.research.google.com>) if you do not have CERN account. You will see 5 different files:
 - 4 .csv files with data for the exercises
 - Student Version.ipynb, with the guided exercises;
 - Solutions.ipynb - if you want to do the exercises on your own, do not open this file for now.
3. Open Student Version.ipynb and follow the instructions.
4. When finished or if stuck, check Solutions.ipynb for the answers.

Lecture hours

Exercise hours

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