

## **Characterization of the proton beam at Cyrcé Cyclotron using Mimosis CMOS Sensor**

Pixel group and C4PI platform at IPHC has developed a CMOS sensor called Mimosis based on semi-conductor detection technology. One of the advantages of the Mimosis sensor is its high granularity and its low material budget.

The actual prototype of Mimosis is composed of a matrix of 1024x504 pixels each of 27x30  $\mu\text{m}^2$ . The Mimosis sensor has been characterized on irradiation facilities at CERN and DESY (Hamburg) and has shown excellent performances in terms of spatial resolution ( $\sim 6 \mu\text{m}$ ) and efficiency ( $\gg 99,5 \%$ ).

Cyrcé is an irradiation facility at IPHC. It delivers a proton beam up to 25 MeV and is used for radiobiology experiments and for the characterization of detectors.

In order to guarantee the characteristics of the proton beam, a set of measurements should be performed to insure the shape and the energy of the beam.

The objective of this internship is, from one side to test the capability of the Mimosis sensor to handle high-rate proton beam and from another side to measure the profile and the Fluency of the proton beam using the Mimosis sensor taking advantage of its high granularity. Indeed, a good knowledge of the profile and fluency, in particular as a function of the size of the irradiation field, is essential to define the dose deposited in the biological samples irradiated on the platform.

During the internship, the student will acquire data with the Mimosis sensor and will do the data analysis. He/she will have the opportunity to work in an interdisciplinary environment combining accelerators, instrumentation, detectors and data analysis.

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