Contribution ID: **62** Type: **not specified**

Crosstalk Characterization of a Digital SiPM in 150 nm CMOS Imaging Technology

Silicon Photomultipliers (SiPMs) are silicon detectors widely used for light detection in contexts where features such as high detection efficiency and temporal performance in ps regime are required. Analog SiPMs are characterized by an array of single cells (SPADs) in parallel, producing signals proportional to the number of photons incident in the active area.
In digital versions of SiPMs, new functionality can be added through the use of electronics that, in some CMOS processes, can be embedded in the same silicon die.
\noindent At DESY a prototype of digital SiPM was developed using LFoundry 150 nm process and is currently being characterized. Among others, one important characterization concerns the intrinsic optical crosstalk of the sensor. Optical crosstalk is a type of correlated noise typical of SiPMs that leads to signal alteration during hit detection. Crosstalk measurements are of fundamental importance in the characterization of SiPMs and can be used to determine signal corrections and optimal working conditions.
Due to the features of the DESY dSiPM, characterizations of individual SPAD crosstalk can be performed extending the studies possible with analogue SiPMs, leading to a better understanding of the physics of the phenomenon.
The student will be guided in understanding the sensor operation and will gain confidence with the DAQ system and measurement setup. Some measurements will be carried out together with the student who will be responsible for operating the setup and analyzing the collected data.

Group

FH-ATLAS

Project Category

B2. Development of experimental equipment (hardware-oriented)

Special Qualifications

Interest in laboratory work is required. Prior experience with hardware and lab data analysis with C/C++, Python or others is welcome but not required.

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