



## **Development of a high performance characterization setup for SiPMs and MPGDs towards their integration in mid-large scale systems**

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Abstract: supported by a common funded project RD51-CERN, a groundbreaking laboratory for training, development, fabrication, applications and innovation with SiPMs and MPGDs and their related technology has been finally commissioned at Universidad Antonio Nariño (UAN) in Colombia.

Silicon Photomultipliers (SiPMs) and Micro-Pattern Gas Detectors (MPGDs) are featured by their remarkable space and time resolution, high gain, robustness and large stability for a wide range of radiation and particles. The UAN expertise on such kind of devices arises from the active contribution to the particle physics community (NEXT-CSIC, RD51-CERN) and optical communications industry (VLC-Colombia) among others.

The UAN has developed an exhaustive characterization protocol and setup to ensure a reliable electrical response of SiPMs and MPGDs under several conditions defined by the user, leading to quantify their intrinsic features at a high rate data production and by issuing a detailed final diagnosis of their performance. The backbone of the characterization platform is just the SiPMs/MPGDs detection units forming the core of a large modular hardware chain. Main hardware PnP (Plug-and-Play) units as a controlled temperature module by GPIB (General Purpose Interface Bus), as well as GPIB controlled low/high voltage (LV/HV) sources and oscilloscopes with advanced triggers and fast viewing modes completes the whole loop of the aforementioned setup. The whole hardware chain featured by its hybrid homemade and manufacturer design elements, runs programmable execution flows written as MatLab and Labview libraries switched by fast and powerful interfaces. The resulting high rate data production is filtered and sort by an optimized computing cluster where the data flow coming from the chain is quickly analyzed.

In this contribution, the main achievements and services generated from the UAN detectors laboratory are presented, where a high performance electrical characterization protocol and setup has been successfully and gradually commissioned.

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