

11th International Workshop on Ring Imaging Cherenkov Detectors (RICH2022)



Contribution ID: 9

Type: **presentation**

The high voltage system the novel MPGD-based photon detectors of COMPASS RICH-1 and its developement towards a scalable High Voltage Power Supply System with system on chip control for Micro Pattern Gaseous Detectors.

Thursday 15 September 2022 11:25 (25 minutes)

The COMPASS RICH-1 detector has undergone a major upgrade in 2016 with the installation of four novel MPGD-based photon detectors. They consist of large-size hybrid MPGDs with multi-layer architecture composed of two layers of Thick-GEMs and bulk resistive MicroMegas. A dedicated high voltage power supply system has been built and put in operation. It controls more than 100 HV channels. The system is required to protect the detectors against errors by the operator, monitor and log voltages and currents at a 1 Hz rate, and automatically react to detector misbehavior. It includes also a sophisticated HV compensation system against environmental pressure and temperature variation. In fact, voltage compensation is always a requirement for the stability of gaseous detectors and its need is enhanced in multi-layer ones. In particular, the needs posed to high voltage power supply systems by the operation of Micro Pattern Gaseous Detectors in terms of high-resolution diagnostic features and intelligent dynamic voltage control are required both when technology development is performed and when extended detector systems are supplied and monitored. Systems satisfying all the needed features are not commercially available.

A single channel high voltage system matching the Micro Pattern Gaseous Detector needs has been designed and realized, including its hardware and software components.

In this talk the COMPASS HV system and its performance are illustrated, as well as the stability of the novel MPGD-based photon detectors during the physics data taking at COMPASS. As further development, the design, implementation and performance of a HV channel based on DC to DC converter and controlled by a FPGA system is presented. The performance of the single channel power supply when connected to a Micro Pattern Gaseous Detector in realistic working condition during a test beam will be shown

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Session Classification: Technological aspects and applications of Cherenkov detectors

Track Classification: Technological aspects and applications