5th International Conference on
Micro-Pattern Gas Detectors (MPGD2017) and RD51 Collaboration Meeting
Temple University, Philadelphia, USA
May 22-26, 2017

Meeting Home Page: https://phys.cst.temple.edu/mpgd2017/
May 22 - 25, 2017: MPGD2017 Conference — May 26, 2017: RD51 Collaboration Meeting

Contribution ID: **18**   Type: **Oral presentation**

The high voltage system for the novel MPGD-based photon detectors of COMPASS RICH-1

Wednesday, 24 May 2017 09:30 (20 minutes)

The detector architecture consists in a hybrid MPGD combination: two layers of Thick-GEMs (THGEM), the first of which also acts as a reflective photocathode thanks to a CsI film is deposited on its top face, are coupled to a bulk MICROMEGAS with pad segmented anode kept at positive high voltage (HV), while the micromesh is grounded; the signals are read-out via capacitive coupling from a second set of pads parallel to the anode ones. The THGEMs are segmented in order to reduce the energy released in case of occasional discharges. The architecture of the detectors implies nine different electrode types and more than 1000 electrodes supplied by more than 100 HV channels. The power supply system is based on commercial components by CAEN. Some original elements are present in the architecture of the HV power supply system:
(i) The distribution to the THGEM segments and to the MICROMEGAS anode pads has been optimized in order to minimize the propagation of occasional discharges to other detector sector;
(ii) The detector gain is kept stable in spite of the variation of the environmental parameters, namely pressure P and temperature T, compensating the HV according to the P and T evolution;
(iii) A sophisticated control software allows to protect the detectors against operator's error, to monitor voltages and current at 1Hz rate, to log all the sparks and to automatically react to detector misbehaviors.
The HV system and its performance are described in detail as well as the electrical stability of the detector during the first year of operation at COMPASS.

On behalf of the Trieste COMPASS group

Primary author: DALLA TORRE, Silvia (Universita e INFN, Trieste (IT))

Presenter: DALLA TORRE, Silvia (Universita e INFN, Trieste (IT))

Session Classification: Applications at future nuclear and particle physics facilites - 4 (Chair: Kondo Gnanvo)