Contribution ID: **291** Type: **Parallel session talk**

An experimental study to understand the physics behind charging-up of Gas Electron Multiplier (GEM)

Wednesday, May 26, 2021 7:30 AM (18 minutes)

Charging-up is a phenomenon observed while working with gaseous ionization detector having dielectric. It is comprised of two processes: the polarization of dielectric due to exposure to high electric field and collection of charges on dielectric surface. Both these charging-up processes affect the gain of the detector as they change the local field configuration around the dielectric. Here, we have studied these effects using experimental techniques for a single GEM detector. It is observed that due to polarization the gain increases following a curve similar to charging-up of a capacitor. However, the radiation charging-up reduces gain depending on radiation rate. The radiation rate was modified by a) collimators, b) strong and weak sources. As the rate increases the rate of collection of charges on GEM dielectric accelerates. Its effects are important for experiments where beam current changes significantly with time and in TPC application which requires gain to be stable over time.

TIPP2020 abstract resubmission?

Yes, this would have been presented at TIPP2020.

Funding information

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Session Classification: Sensors: Gaseous Detectors

Track Classification: Sensors: Sensors: Gaseous Detectors