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How many electrons can fit in a GEM hole?

Tuesday, 23 May 2017 15:00 (4 minutes)

The key parameters for a long-term operation of GEM-based detectors in the harsh environment of high-rate experiments are radiation hardness, ageing resistance and stability against electrical discharges. Therefore, a comprehensive understanding of the discharge mechanism is mandatory to assure a stable operation of the detector.

We report on discharge probability studies in single- and multi-GEM structures in Ar- and Ne-based gas mixtures. Our experimental findings are in line with a well-grounded hypothesis of charge density being the driving factor for a discharge formation in GEMs.

Results of the measurements are compared to the outcome of the GEANT simulations. The latter can be used to estimate a critical charge, which leads to a formation of a spark in a GEM hole.

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