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Shorts and Gain Compensation in Triple-GEM

Triple Gas Electron Multipliers (Triple-GEMs) are gas detectors used in the Compact Muon Solenoid (CMS) experiment at CERN, for muon reconstruction and measurement. During operation, GEM detectors are subject to electrical discharges, for example due to the presence of dust particles near amplification regions. Such discharges may lead to "shorts", i.e. short circuits between the electrodes of the detector. The goal of my project is to study the impact of these "shorts" on the performance of the detector, in particular on its efficiency. To do so, I simulate the presence of one or more "shorts" on different GEM foils by lowering the voltage applied to the affected foils. The final objective is to determine if and how it is possible to compensate for the loss of gain caused by the "shorts".

This poster presents the characterization of the GEM prototype used in the studies and the results obtained so far.

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