## Simulation of MPGD based Hadron Calorimeter HCal for future Muon Collider

This contribution presents a detailed GEANT4 based simulation study of the MPGD-HCAL prototype. The simulation implements the geometry of the prototype that is going to be tested under pions beam in November 2025 at PS facility at CERN. The prototype consists of 12 layers of alternating stainless steel absorber and the MPGD. The first 8 layers have an area of 20x20 cm<sup>2</sup> and this setup has already been tested in the previous test beam campaigns, showing good performances also in terms of data-to-simulation agreement. The setup, both in the simulation and in the experimental prototype, is currently extended to include 4 additional layers with an area of 50x50 cm<sup>2</sup>. This study , carried out with pion beams with energies ranging from 1 to 10 GeV , targets the optimization of the prototype layout in terms of shower containment and energy resolution and to support the future analysis of the experimental data.

## Workshop topics

Detector systems

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