

# Commissioning of the CGEM Inner Tracker

*Friday, 31 May 2024 15:41 (1 minute)*

The extension of the BESIII experiment (IHEP, Beijing) till 2030 prompted a program to improve both the accelerator and the detector. In particular, the current inner drift chamber suffers from aging and it is proposed to replace it with a detector based on cylindrical GEM technology.

The CGEM tracker consists of three coaxial layers of triple GEM. The tracker is expected to restore efficiency, improve z-determination and secondary vertex position reconstruction compared to the current inner tracker, with a resolution of 130  $\mu\text{m}$  in the xy-plane and better than 300  $\mu\text{m}$  along the beam direction.

A special readout system was developed for data acquisition. The signals from the detector strips are processed by TIGER, a custom 64-channel ASIC developed in CMOS 110 nm UMC technology, providing analog charge readout via a fully digital output with linear charge readout up to about 50 fC and less than 3ns jitter. TIGER continuously transmits data across the threshold in triggerless mode to an FPGA-based readout module, the GEM Read Out Card, designed specifically for this system. The module configures the ASICs and organizes the incoming data by creating the event packets when the trigger arrives.

The three layers were assembled in October 2023, and a cosmic ray data collection campaign is underway to evaluate the performance of the CGEM tracker before installation.

In this presentation, the general status of the CGEM-IT project will be presented with a particular focus on the first results from cosmic ray detection.

## Collaboration

BESIII Italia

## Role of Submitter

The presenter will be selected later by the Collaboration

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