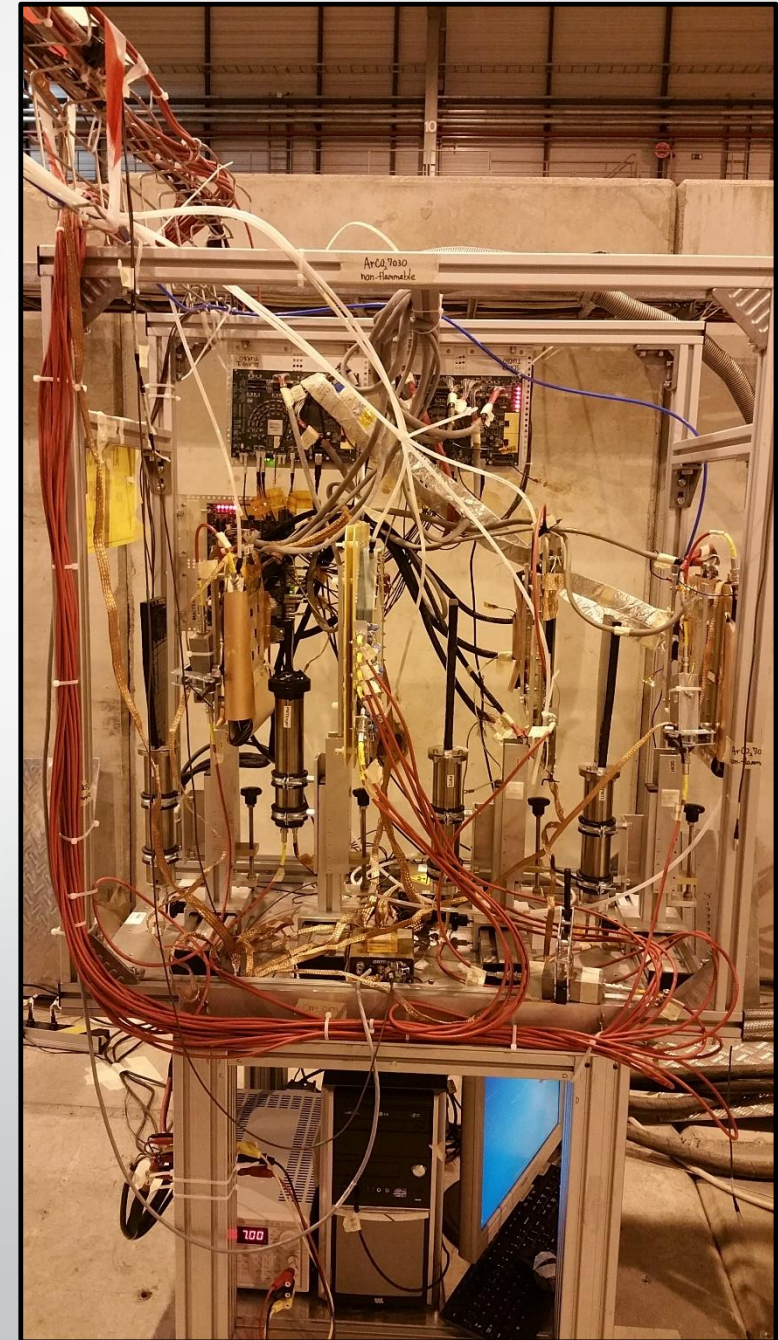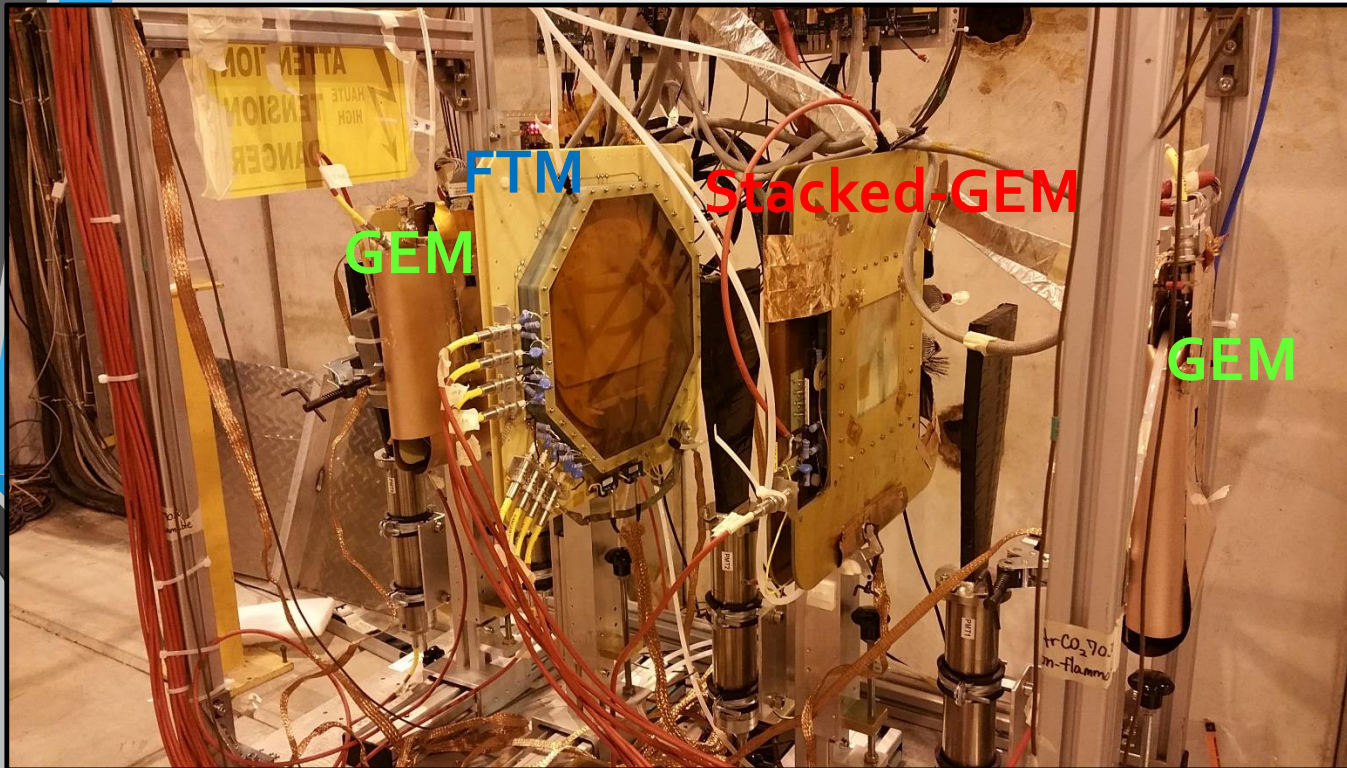# CMS GEM H$_4$ Test Beam

Ilaria Vai on behalf of the CMS GEM Collaboration

Setup

- A Stacked-GEM detector and a FTM detector under study
- Stacked-GEM detector with $Ar/CO_2/CF_4$ mixture
- 2 triple GEMs for tracking
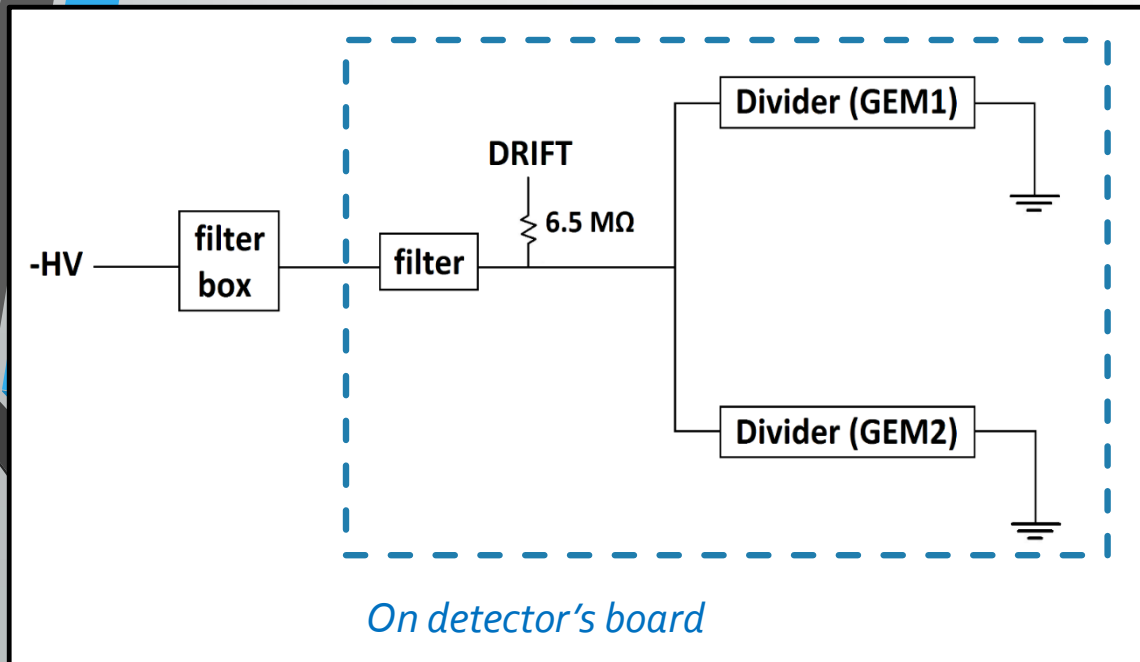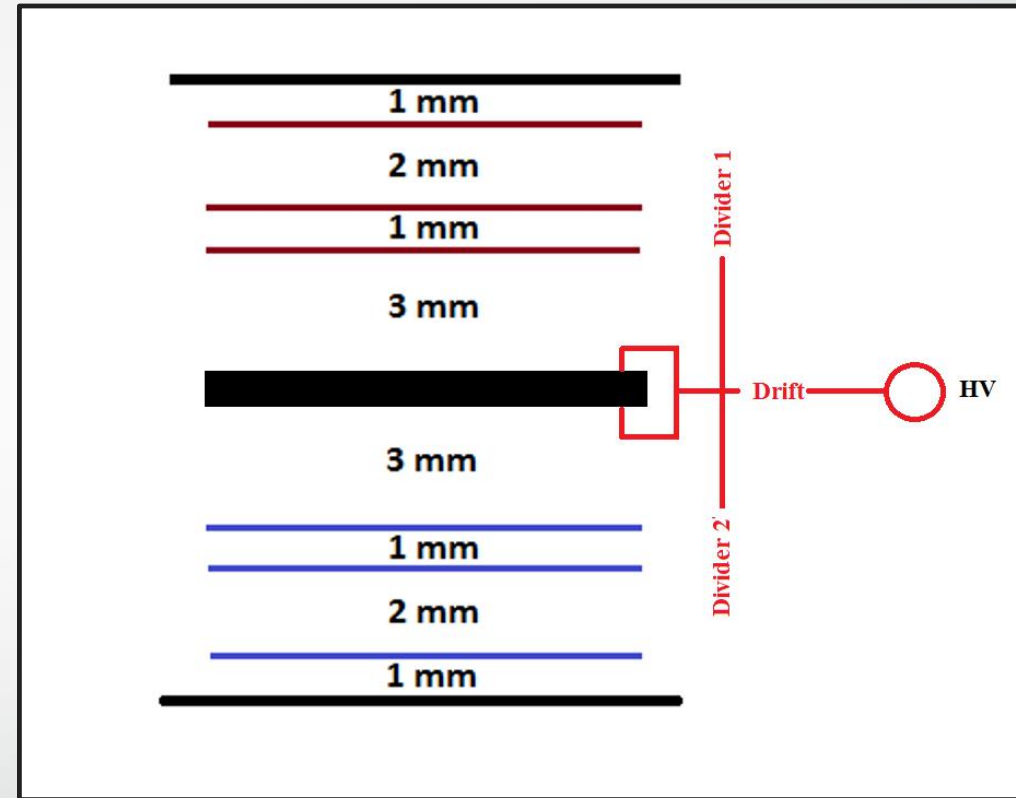- 3 PMTs and a Finger-PMT for trigger

BEAM

Stacked GEM: Detector's description

- The detector is composed of two stacked triple-GEM detectors, each one with parallel readout strips

  - One GEM has 256 strips in the $x - $ axis

  - One GEM has 256 strips in the $y - $ axis

A single HV supply powers both the triple-GEM

On detector's board

Measurement performed with Stacked GEM

- Full characterization of the detector to measure spatial resolution, time resolution and efficiency with $Ar/CO_2/Cf_4$, to be compared with results of the previous test beam performed with Ar/CO_2

- Readout system: 4 VFATs mounted on the chamber (2 per side) + Turbo

- Spatial resolution and efficiency:

☐ HV scan with different values of thresholds and latency of the VFATs

Time resolution:

☐ Analysis of 2 VFATs installed on the two sides of the stack, in order to compare performance of the two Triple-GEM

☐ HV scan with fixed configuration of the VFATs

☐ Scans in Icomp, Ishaper and Threshold at fixed HV in order to find best configuration of parameters from the timing point of view

Thanks to RD51 for the support during the test beam!