

HFCC Muon Report

FHCC-ee Muon detector

April 17, 2026

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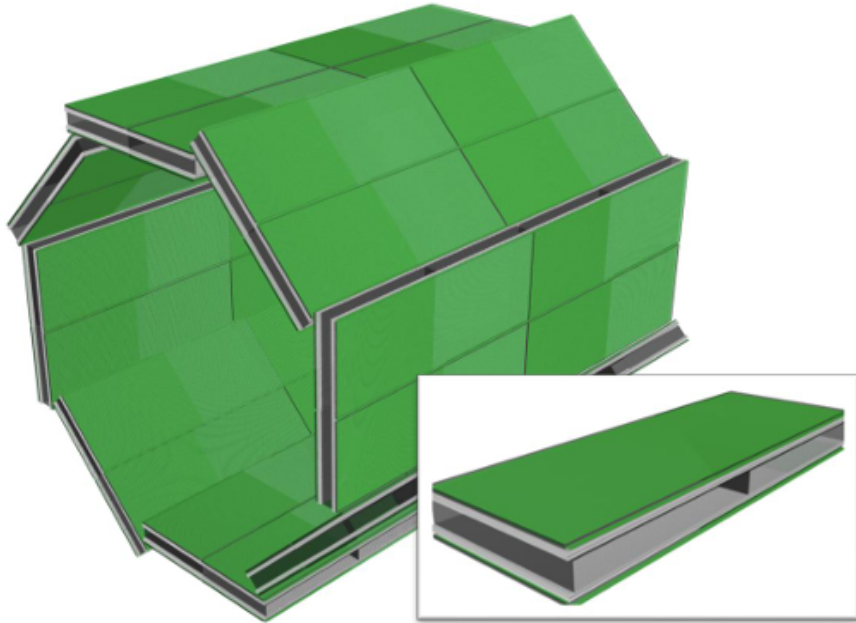
- 1) Drift tube + scintillation strip system R&D
- 2) uRWELL (will be reported by Marcus)

News

- Jianming Qian – Co-coordinator of ALLEGRO Muon Detector Concept collaboration. The first muon detector meeting:
<https://indico.cern.ch/event/1671835/>
 - Report by Jiajin Ge on “Drift tube + scientization strip muon system”
 - Prototype built and tested in test beams at CERN (reported last meeting)
 - Test beam finished, data analysis is ongoing, will report next meeting
 - Funding for 2026 are all committed (hardware and engineer/technician)
- Report GEANT4 simulation → Digitization will use test beam data
- We were asked to include the Muon detector simulation to the ALLEGRO detector simulation package
- Proposal for continuing R&D for 2027 will be submitted before May 1

Geometry in DD4hep

- **Muon System**
 - Barrel

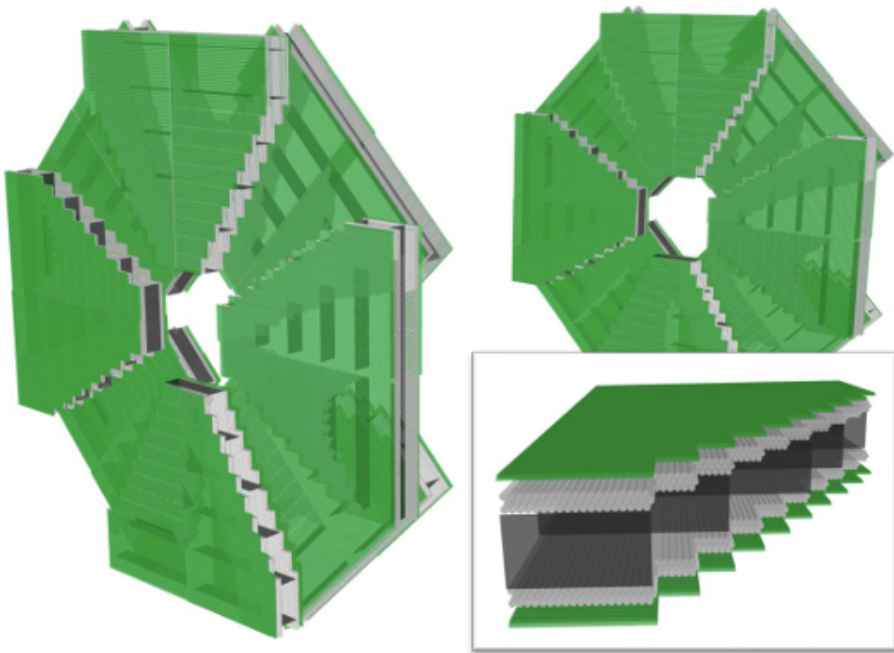


Muon Barrel (module)

- **Main parameters**
 - **Tube**
 - Length 6000mm
 - Outer diameter 30mm
 - Inner diameter 29.2mm
 - **Scintillator**
 - Length 2200mm
 - Hypotenuse 40mm
 - **Center gap thickness 317mm**

Geometry in DD4hep

- **Muon System**
 - EndCap



Muon EndCap (module)

- **Main parameters**
 - **Tube**
 - Length 1000~3700mm
 - Outer diameter 30mm
 - Inner diameter 29.2mm
 - **Scintillator**
 - Length 586~2170mm
 - Hypotenuse 40mm
 - **Center gap thickness 300mm**

HFCC-ee Muon detector R&D FY 2026 Funding and FY 2027 Request

FY 2026 proposed work and funding spending status

Constructed two small prototype modules with 8 triangular strips each, for a total 32 readout channels, characterize their performances through test beams at CERN and cosmic studies at Michigan

Received R&D funding for FY2026: \$50k

- Engineer and Technician support: \$30.6k (salary, \$23.6k, and fringe benefits, \$7.0 k)
- Materials & Supplies: \$9.0k (module construction jiggling, fiber holder, SiPM holder, PCB boards, module shipping box)
- Indirect cost (26%): \$10.3k

The FY26 R&D funds are spent or committed in this FY. Expect to be all spent by September 30, 2026

FY 2027 Proposal and funding request

Continue the study of the performance of the prototype modules, focusing on improving the timing and spatial resolutions. We need to construct a 5m long lightbox to study the performance of long scintillator/fiber detector and develop realistic detector concept.

FY2027 Funding Request: \$50k

- Engineer and Technician support: \$25.7k (Salary: \$20.6k, Fringe: \$5.1k)
- Materials and supplies: \$14.0k
 - Lightbox and the light source control system: \$7k, Fibers: \$3k (with minimum order requirement), SiPMs: \$2k, Supplies: \$2k
- Indirect cost (26%): \$10.3k