



AC-LGAD Beam Tests in FY25 for eRD112

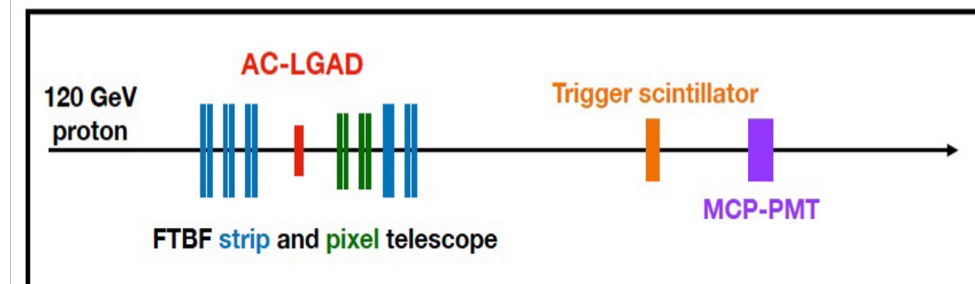
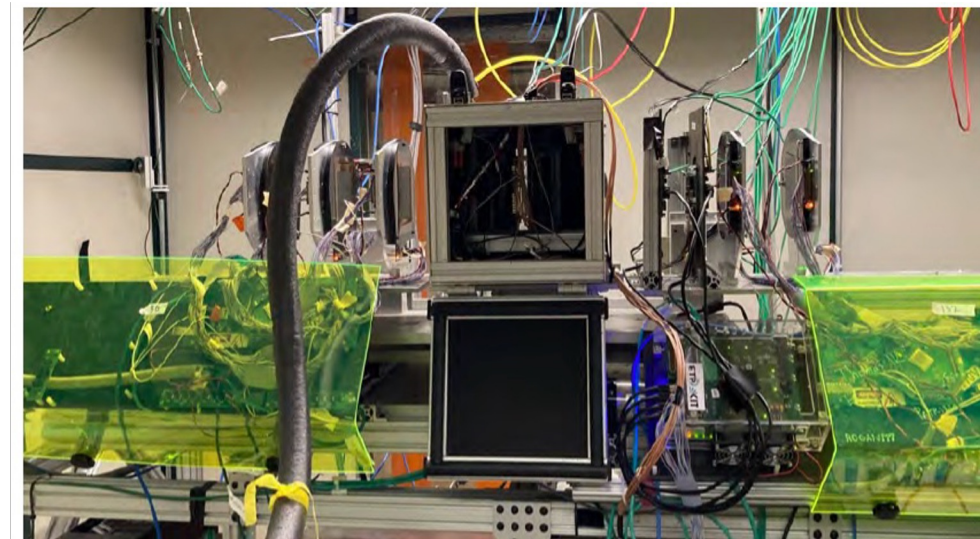
Zhenyu Ye

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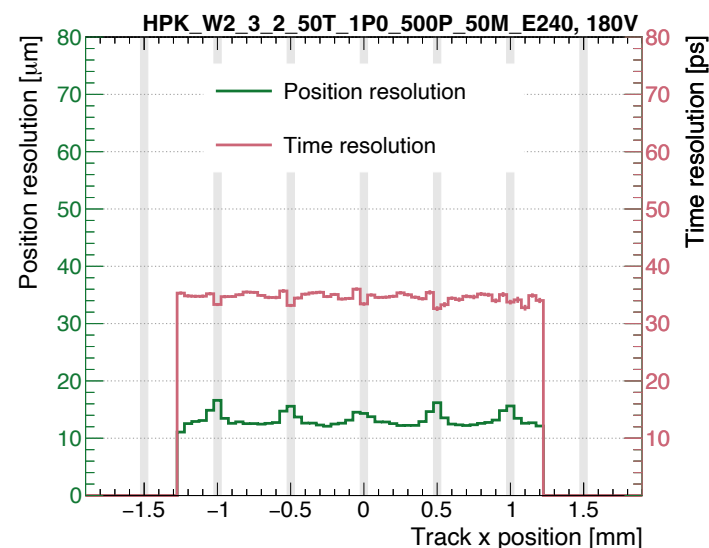
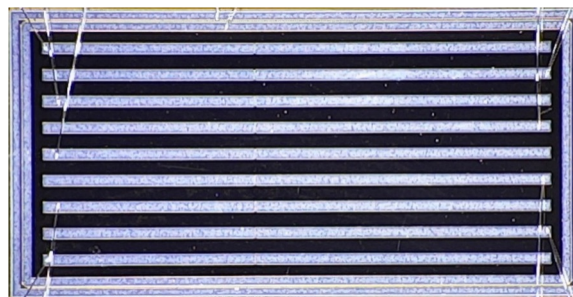
AC-LGAD Beam Tests beyond FY24

- Sensors with different configurations produced by BNL-IO and HPK, and tested with 120GeV protons
 - Constrained by the availability of the FTBF telescope
 - Not straightforward to add new detectors for data taking and analysis
- => Assemble a movable telescope for ePIC SVT and AC-LGAD

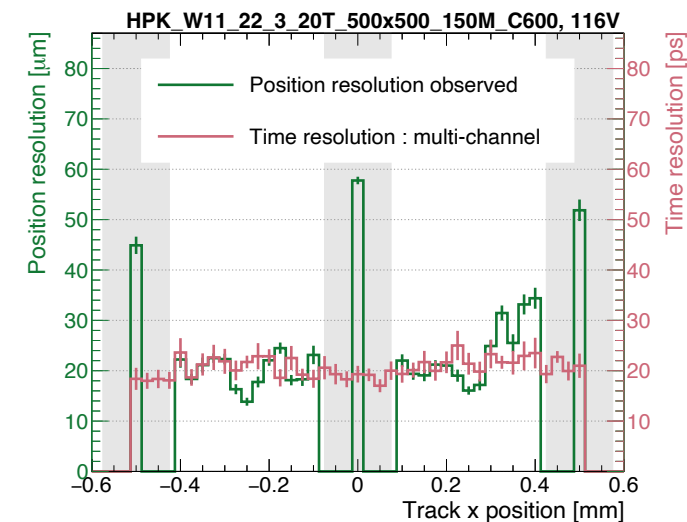
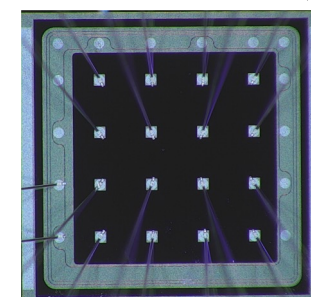
Fermilab Test Beam Setup



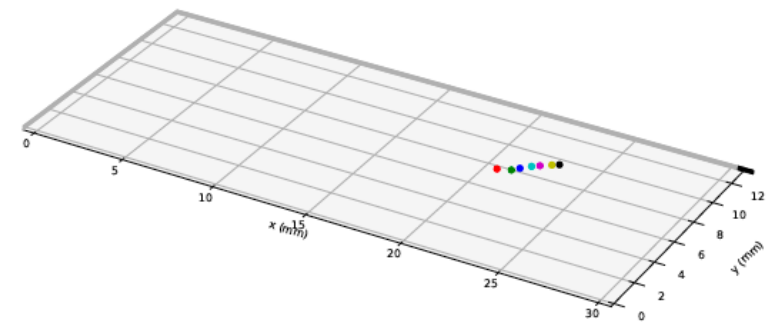
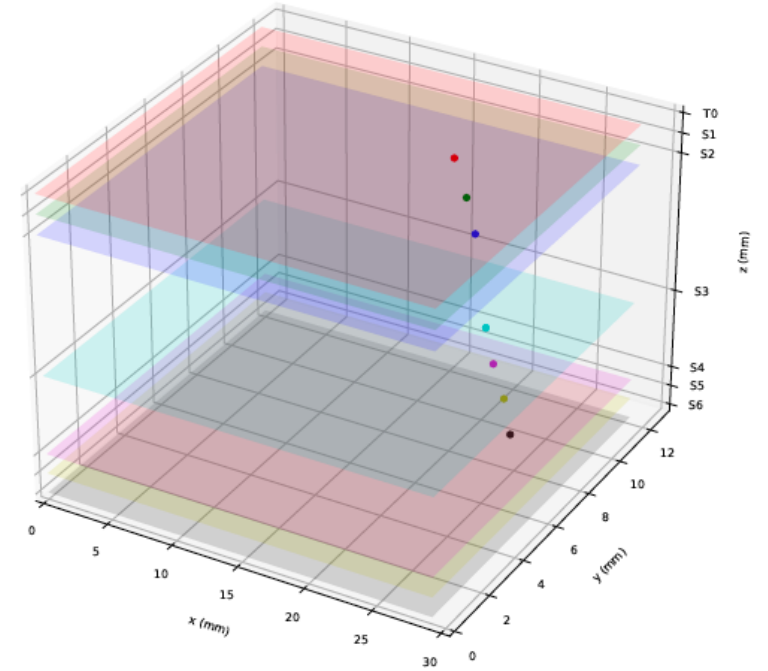
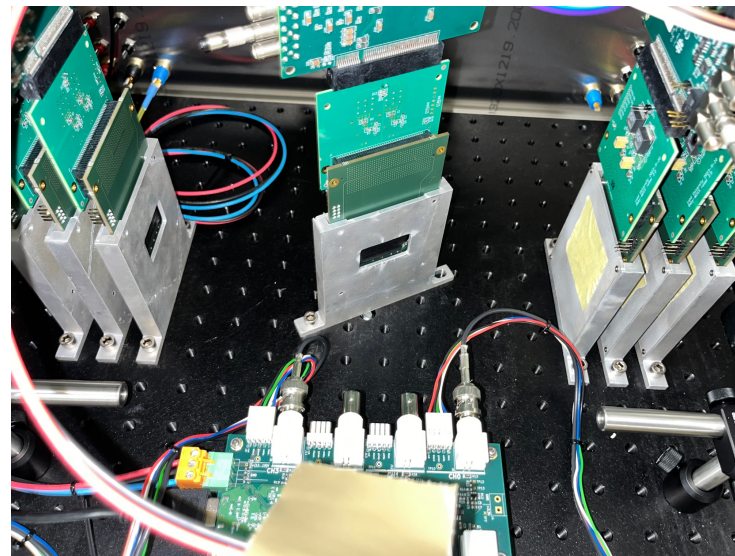
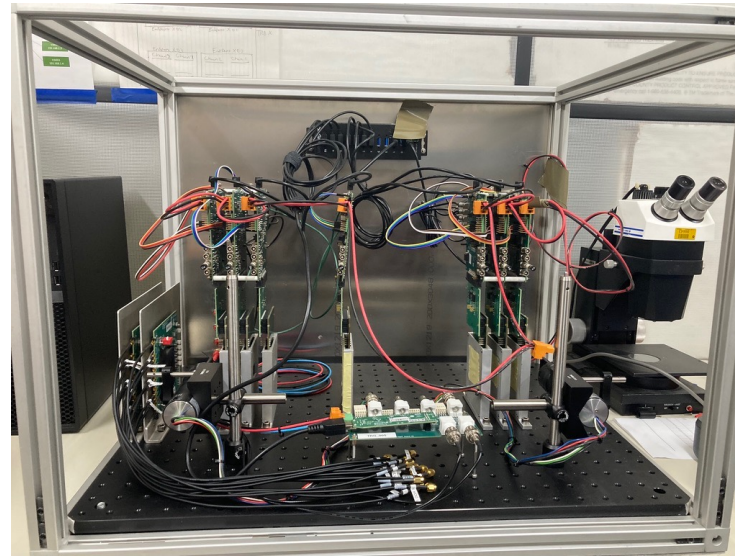
HPK Strip Sensor (4.5x10 mm²)



HPK Pixel Sensor (2x2 mm²)



BabyMOSS+ETROC2 Telescope at FTBF



Summary and Outlook

- **FY24 (FTBF)**

- Commissioned a 6+1 babyMOSS MAPS telescope and took data with 120 GeV protons at FTBF on 5/22-5/28
 - Spatial resolution 6 um is consistent with expectation
=> 2-3 um spatial reference uncertainty with 6 reference planes
- In the process of commissioning the telescope with additional DC-LGAD planes on 6/26-7/12
 - Integrate babyMOSS and DC-LGAD in the EUDAQ2 framework
 - 35 ps per plane => 25 (18) ps timing reference uncertainty with 2 (4) reference planes

- **FY25**

- Integrate babyMOSS and DC-LGAD (if not already done in FY24)
- AC-LGAD beam tests in FY25 (**DESY, FTBF, Jlab to be considered**)
 - AC-LGAD sensor: full size strip and pixel HPK sensors for beam test in FY25 Q2/Q3
 - FCFDv1.1: ready for beam test in FY25 Q2
 - EICROC0.1, EICROC1: ready for beam test in FY25 Q2/Q3?

Resource	Task	Efforts	Budget (k\$)
Scientist	overseeing and co-ordination	5% FTE	0 (in-kind)
Engineer/Technician	25% FTE	beam test setup design	75
Travel	setup and data taking	two times 2 weeks of domestic travel	10
M&S	beam test setup fabrication	-	10
Total			95