CERN Beam time application: Barrel Imaging Calorimeter

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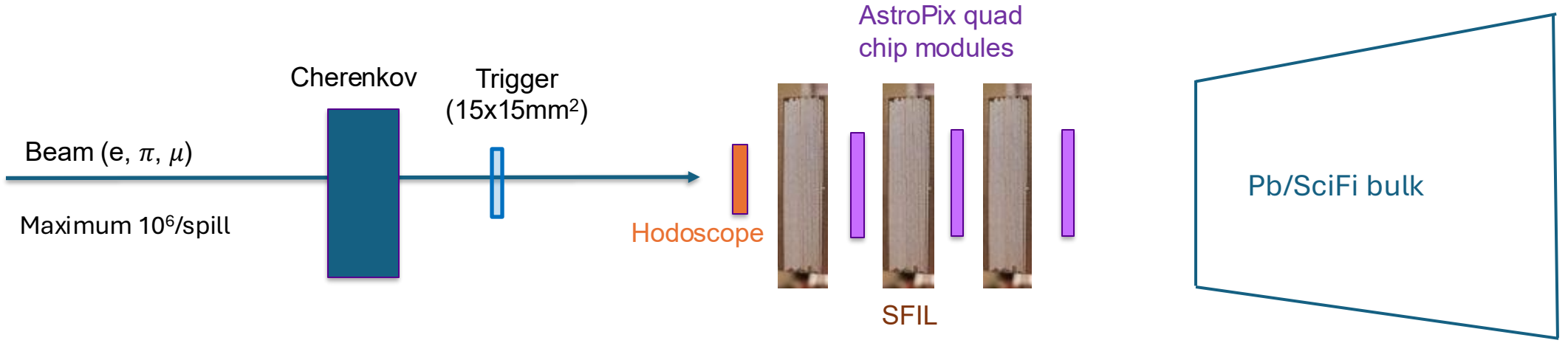
Goals and Justification

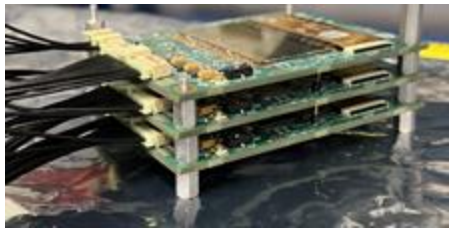
- Goals
  - H2GCROC readout
  - AstroPix modules with large coverage (quad or 9-chip) to contain electron shower
  - Electron/pion/muon response for improved Pb/SciFi: imaging+bulk
  - Syncronized data taking of AstroPix modules and Pb/SciFi
- Justification
  - Although we achieved a proof-of-principle shower imaging using AstroPix-calorimeter syncronized setup, previous beam test has limitation in AstroPix coverage(single chip) and and different from the BIC final design in readout and calorimeter dimension.
  - The beam test at CERN is crucial for testing many aspect of H2GCROC readout under beam condition, as well as full shower imaging of electron/pion with more AstroPix coverage.

Beam time, particle types, beam energies

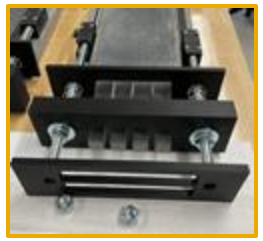
- Beam time: a week in July-August
- Beam line: PS (T10)
- Beam energies, particle types
  - Electron 0.5~10 GeV/c
  - Pion 1~10 GeV/c (electron/pion mixed beam)
  - Muon 5 GeV/c

Future BIC beam test plan at CERN PS

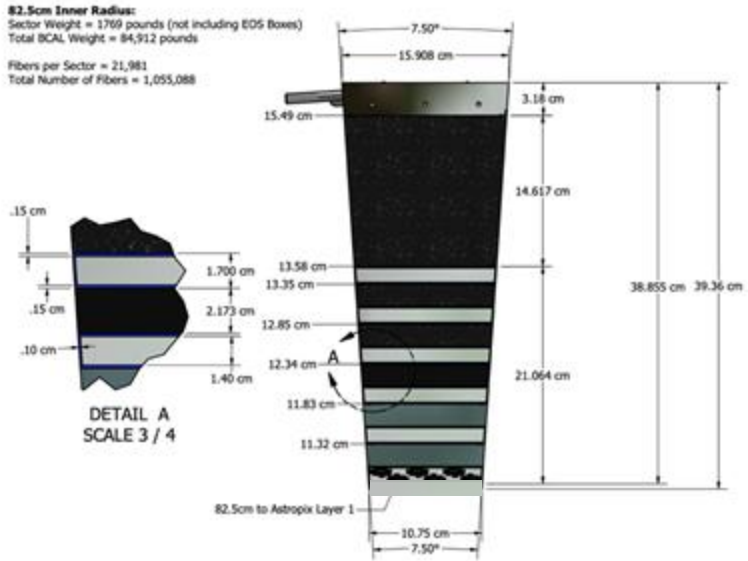




AstroPix quad chip modules



50cm-long SFIL at ANL
(Scintillating Fiber Imaging Layer)



BIC sector dimension

(setup 1) AstroPix, H2GCROC+Pb/SciFi test
(setup 2) Imaging layer with SFIL&AstroPix

Detector preparation:

- 3 AstroPix quad chips are ready.
- Readout box with SiPM+LG will be built.
- HGCROC readout is a key item.
- Korean group will build a bulk and SFILs
- (backup: Baby-bcal, 3 SFILs and bulk at ANL.)