ProtoDUNE Cryostat Feedthrough Considerations

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Timeline and Open Issues

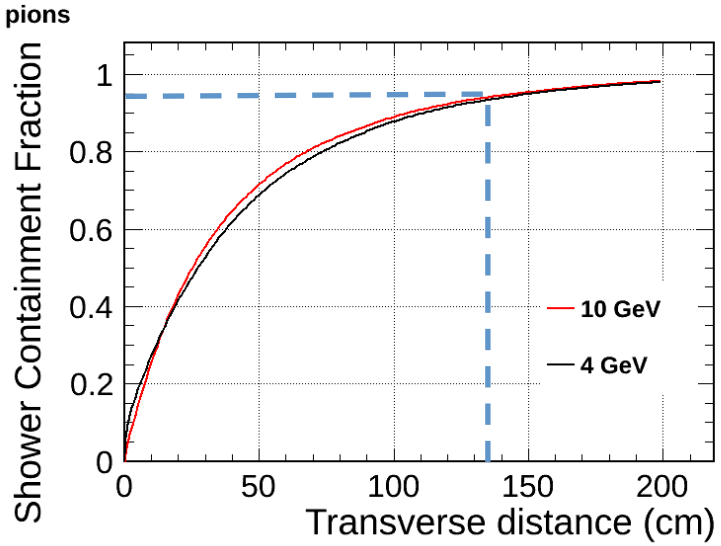
Engineering meeting next week at CERN to **finalize** cryostat design and feed-throughs

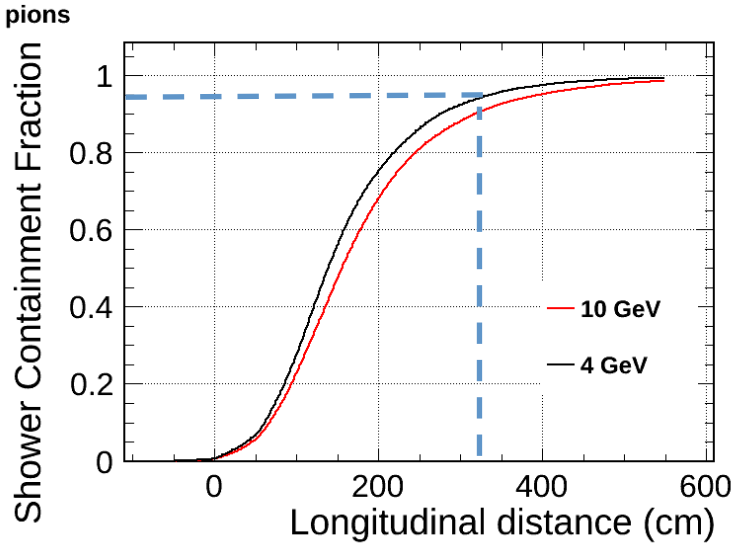
Loosely defined components which need to be better defined:

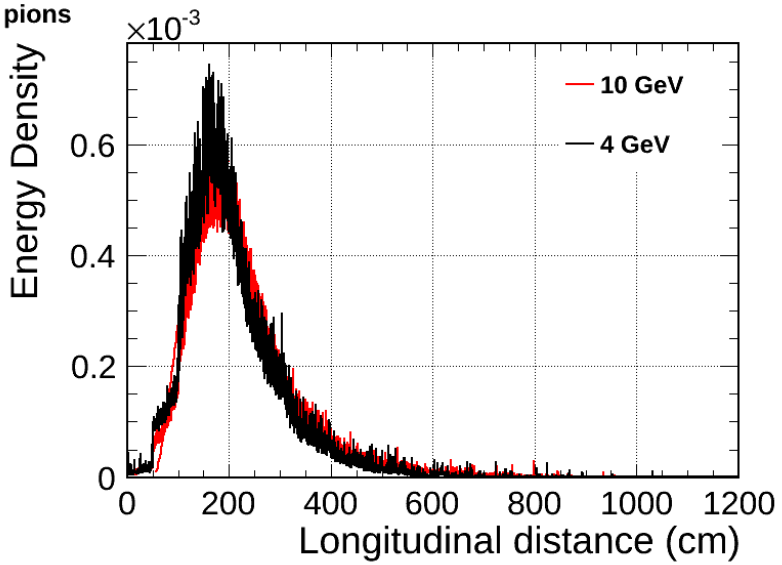
- Beam window positions + dimensions
- Beam particle tagger feed-throughs
- Slow control feed-throughs

- Laser calibration feed-throughs
  - To be addressed during workshop (Igor Kreslo)
- Spare feed-throughs
  - How many, dimensions, locations ?
- …

Pion Containment



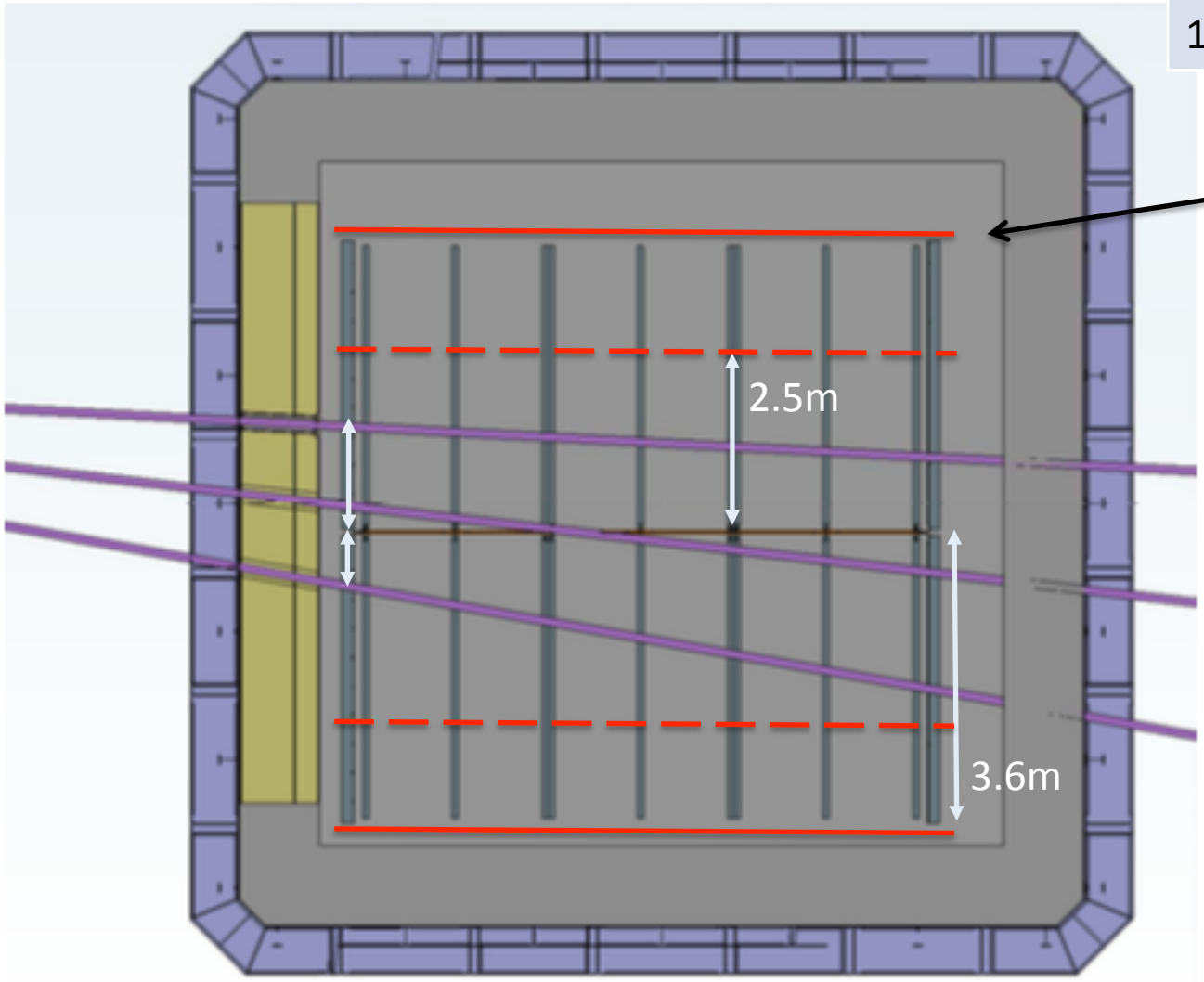




95 % containment envelope
Transverse: 1.35 m
Longitudinal: 3.2 m

~99 % containment envelope
Transverse: 2.1 m
Longitudinal: 5.3 m

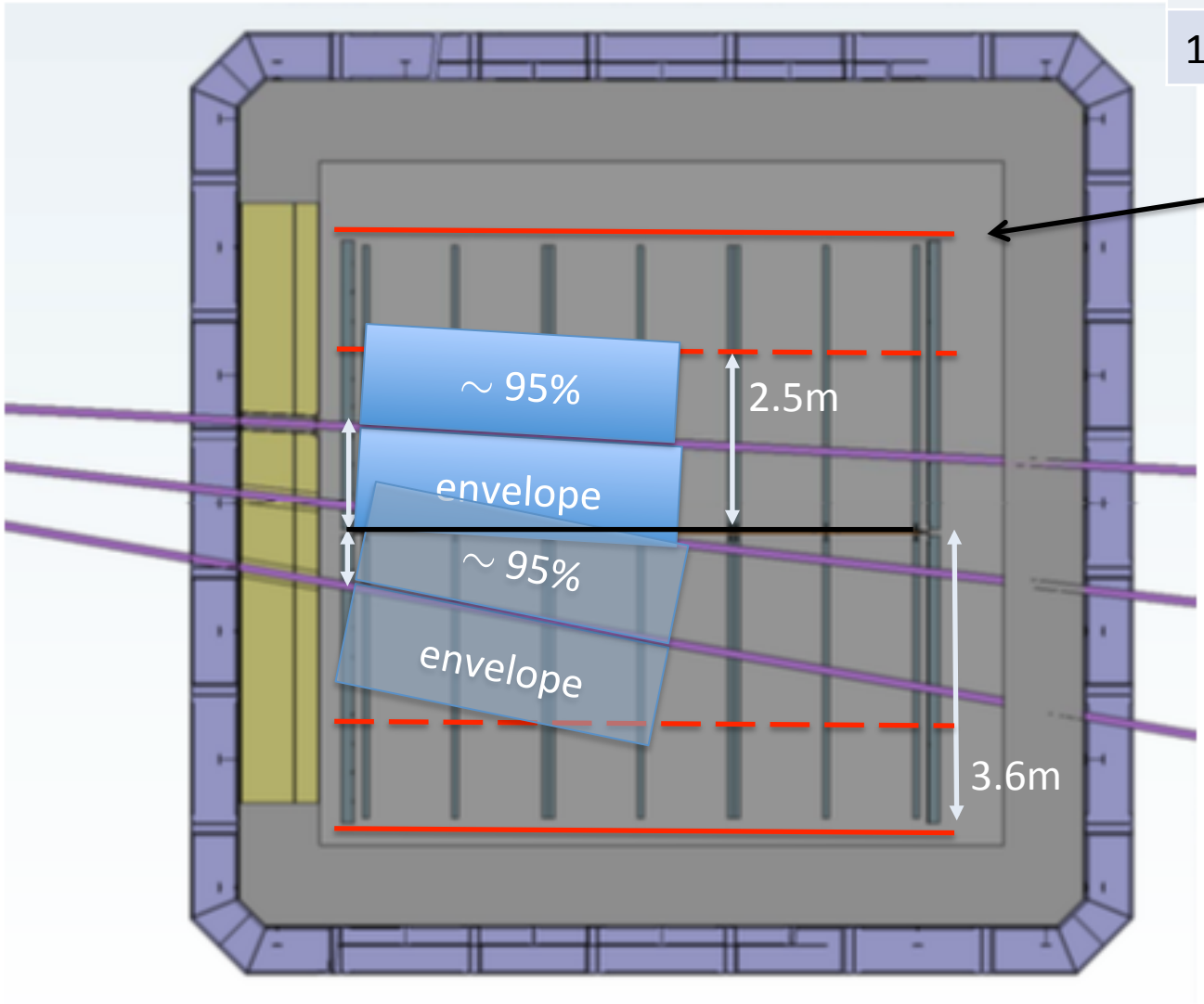
Horizontal angle [°]	Off-set [cm]
3	145
6.5	15
10	-70



Numbers estimated from Tim's slides (approximate only)

Interference with cathode

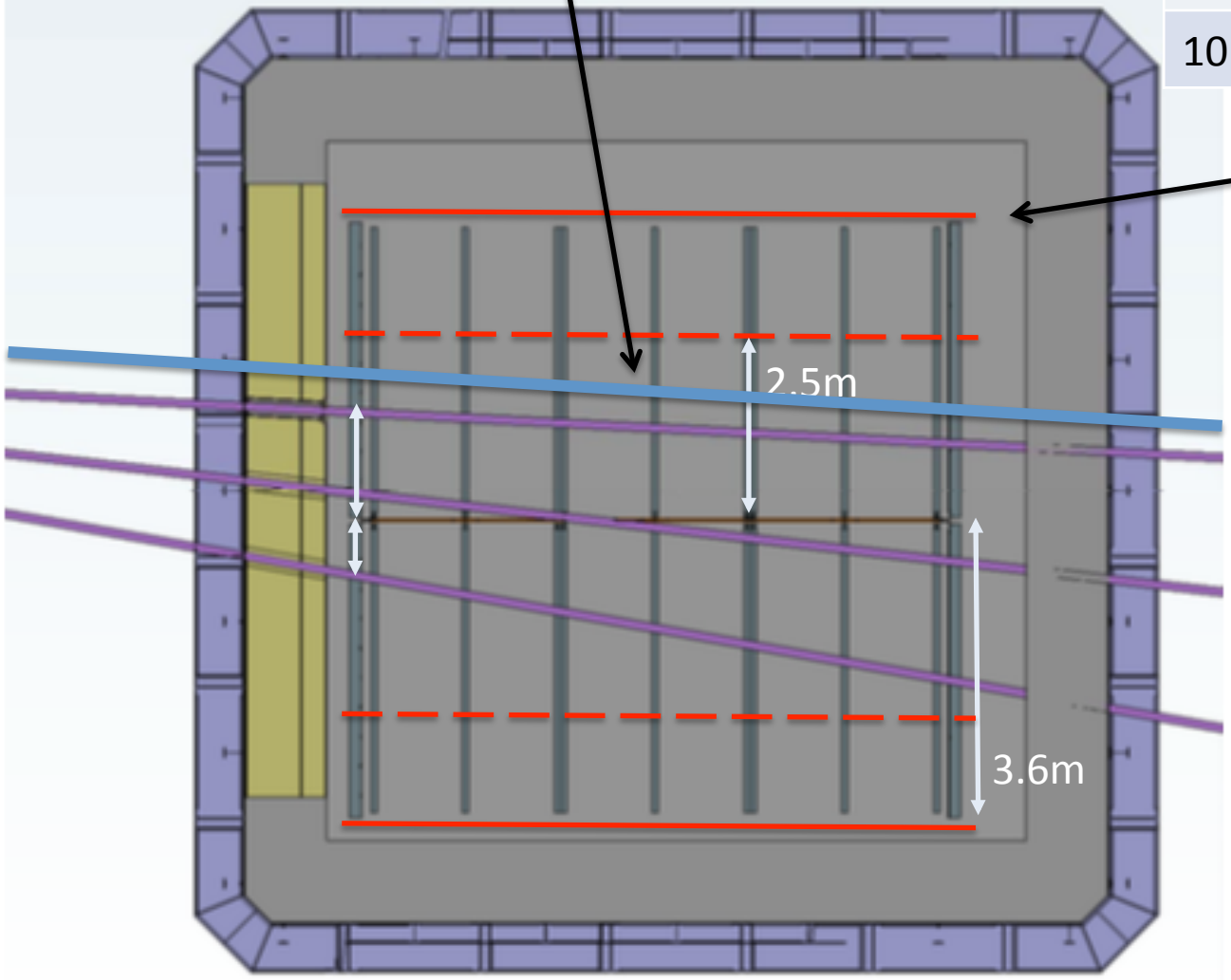
Horizontal angle [°]	Off-set [cm]
3	145
6.5	15
10	-70



Recommendation for beam injection points:
→minimize overlap between shower and passive detector components

Horizontal angle [°]	Off-set [cm]	Drift length [cm]
> ~3	180	360
6.5	15	
10	-120	250

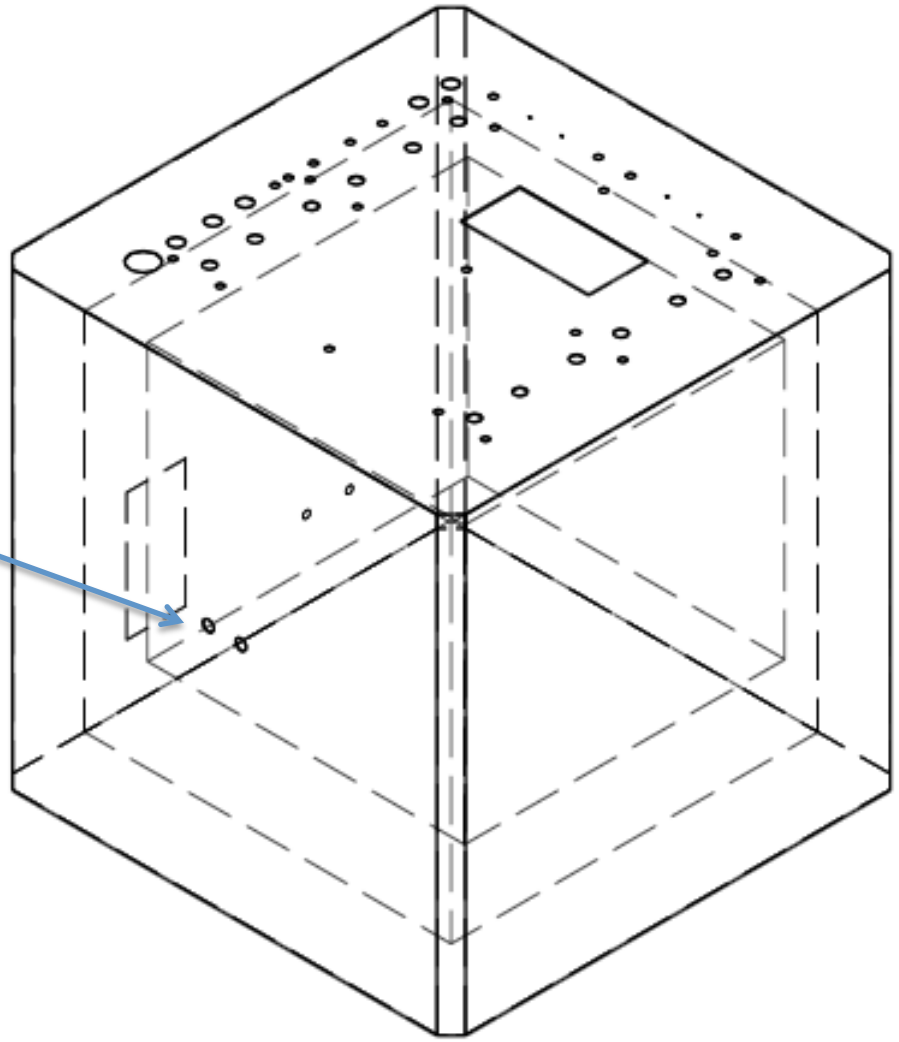
Showers for lower energy primaries fully contained
In single drift volume (3.6m)



Vertical Beam access

Presently included beam window positions

What is height relative to TPC ?



Beam Particle Tagger

Purpose: identify beam particle leaving beam window and entering active volume (active trigger)

+ position measurement

(+ maybe also energy measurement ?)

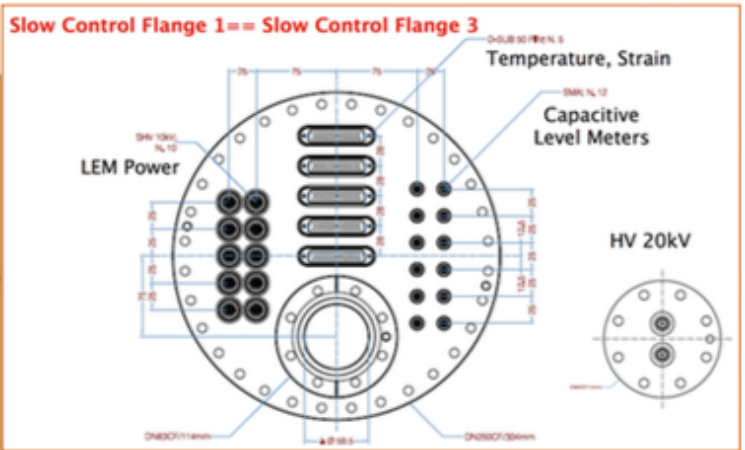
Position: In front of every beam window

Type: thin fiber tracker (2 layers)

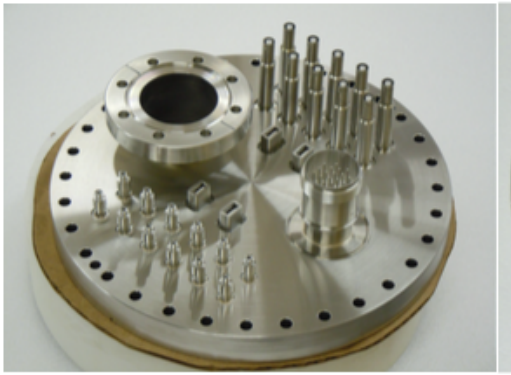
→ Requires feed-throughs for power and signal connections

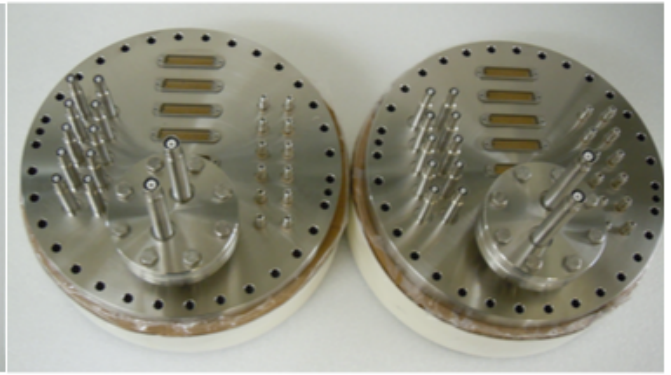
→ But not well defined at this time

→ Assume generic feed-through at this time



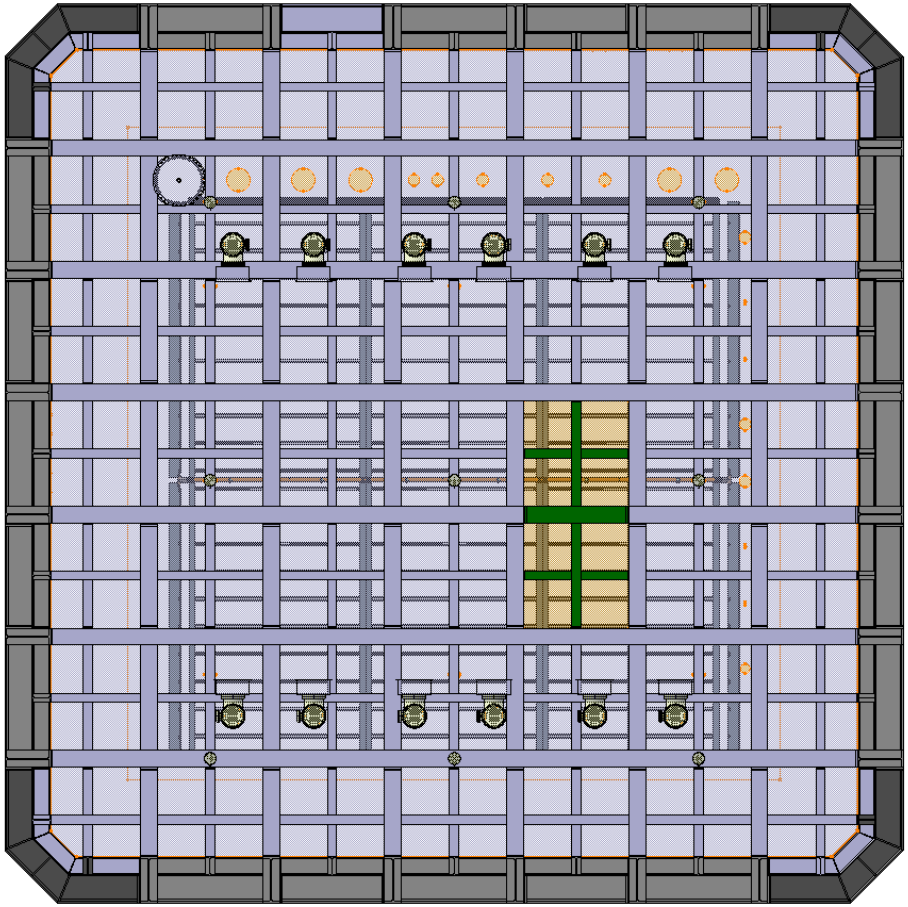
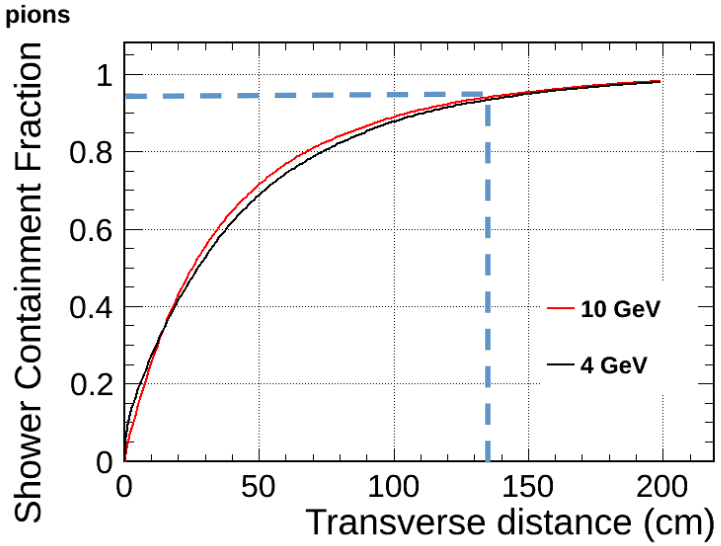
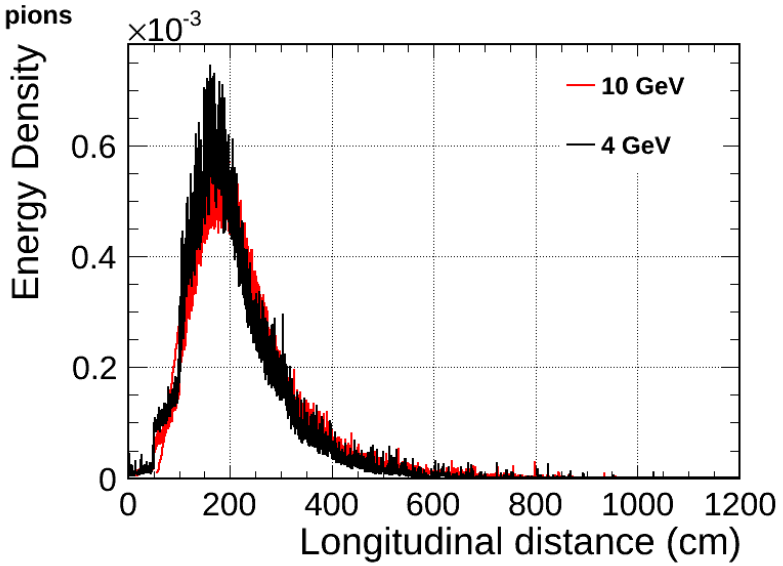
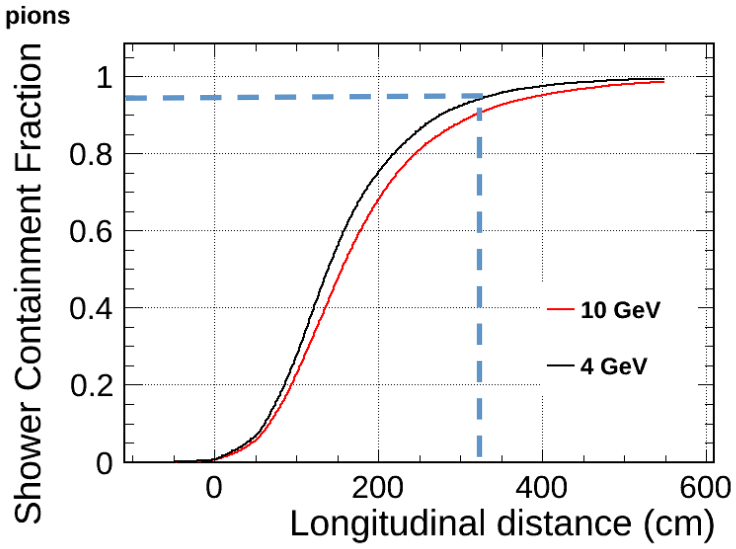
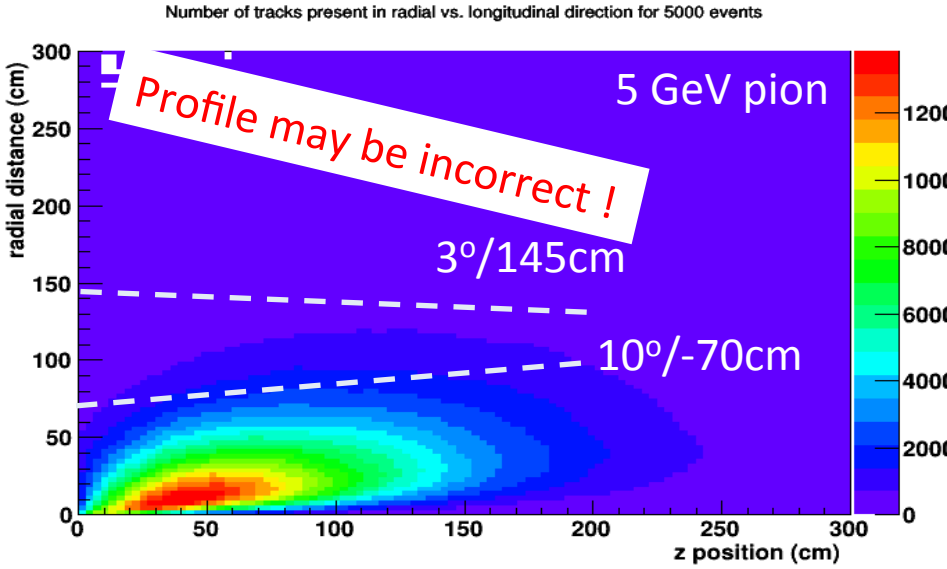
WA105 slow-control feed-through





Presently defined feed-throughs

https://edms.cern.ch/document/1543241
https://edms.cern.ch/document/1543254



Pion Containment