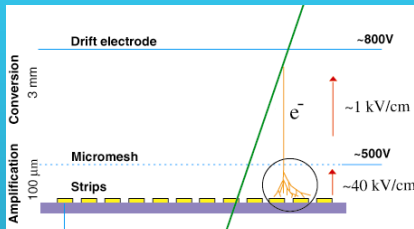


Principle and key issues

MICROMesh Gaseous Structure (Giomataris *et al.*, 1996)

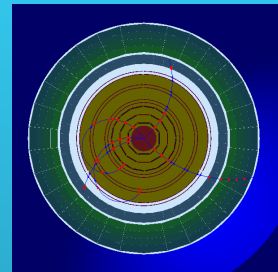


Advantages:

- gaseous detector \Rightarrow less material than Si
- (much) cheaper
- better θ resolution

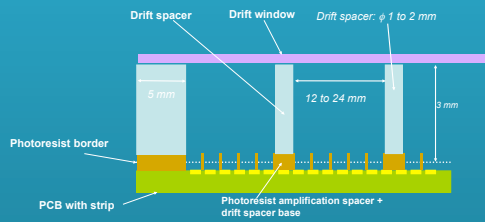
Challenges:

- strong magnetic field \Rightarrow Lorentz angle
- cylindrical thin detector (bulk)



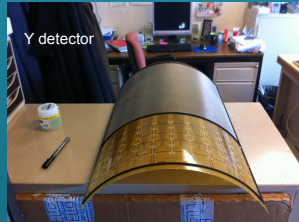
R&D

Bulk technology

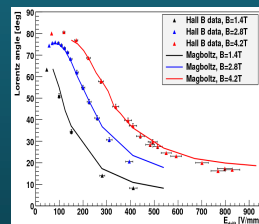
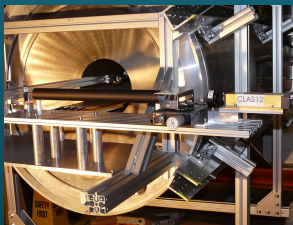


The whole detector is built in a single process

- Robust detector
- Thin PCB (< 0.2 mm)
- ➔ **Curved detectors!**
- Curvature down to 10 cm



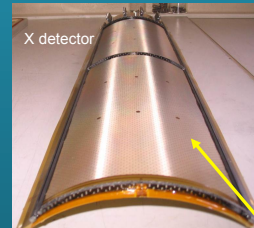
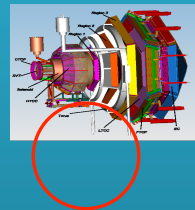
Tests with magnetic field up to 4.5 T @ JLab



- **Micromegas works in 4.5 T environment (worldwide premiere)**
- Can lower the Lorentz angle down to 20° , as required by the simulation
- Extensive tests with cosmics, UV laser, sources, CERN beams

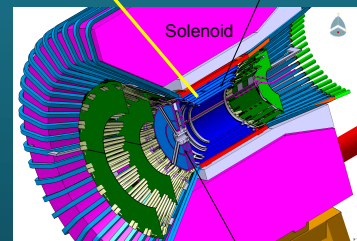
Integration in CLAS12

Part of the CLAS12 central detector

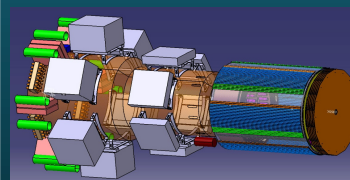


- Design of a support structure
- Curved prototypes built (X,Y), showed good homogeneity

BMT: 3x2 curved Micromegas



FMT: 3x2 flat Micromegas



- Downstream electronics
- 1.5 m long braid
- Dedicated chip (DREAM)

