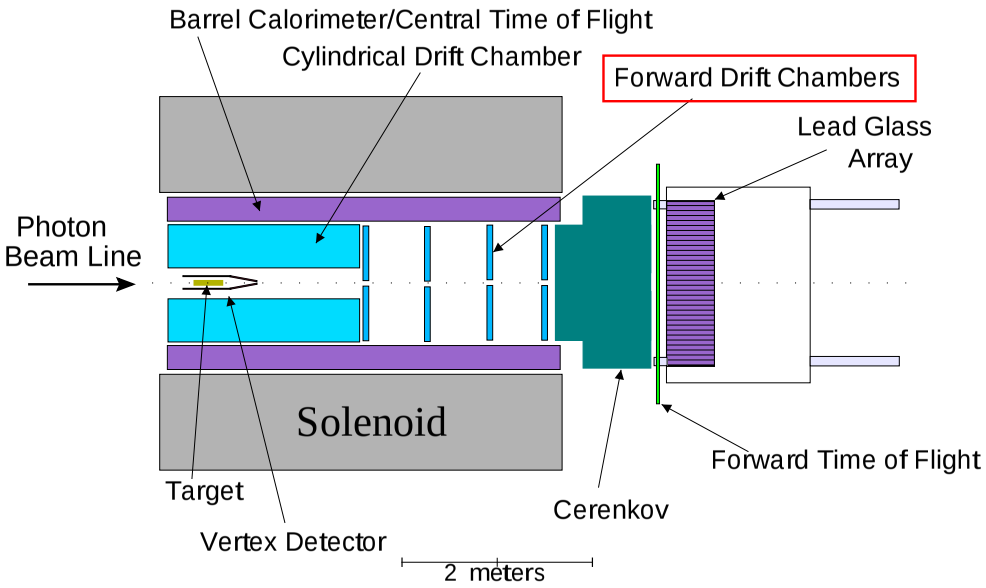
Forward Drift Chambers



FDC overview:

- *Four separate detector packages.*
- *Tracking out to 30 degrees.*
- *Position resolution 150 microns.*
- *Six wire planes between cathode readout planes.*

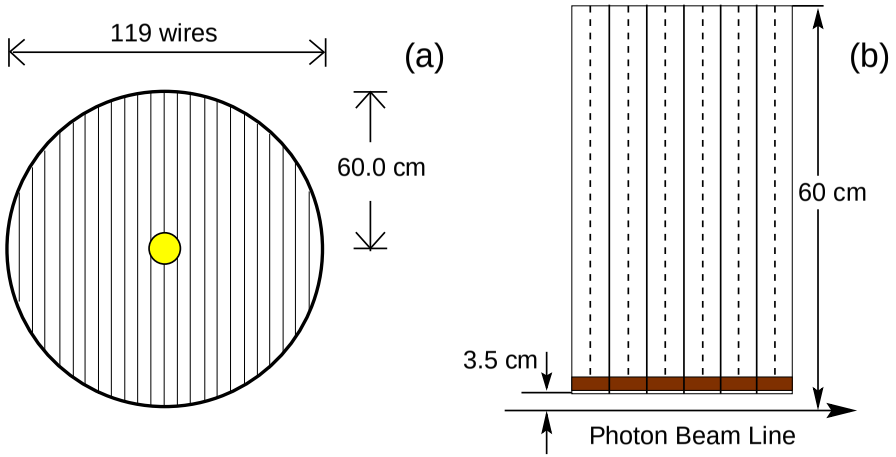
Ongoing design work:

> *Monte Carlo studies:*

- *Finalize the # of packages and planes; determine z–positioning.*

> *Prototyping FDC design:*

- *Cathode strips are the essential new aspect to study.*



FDC Prototype

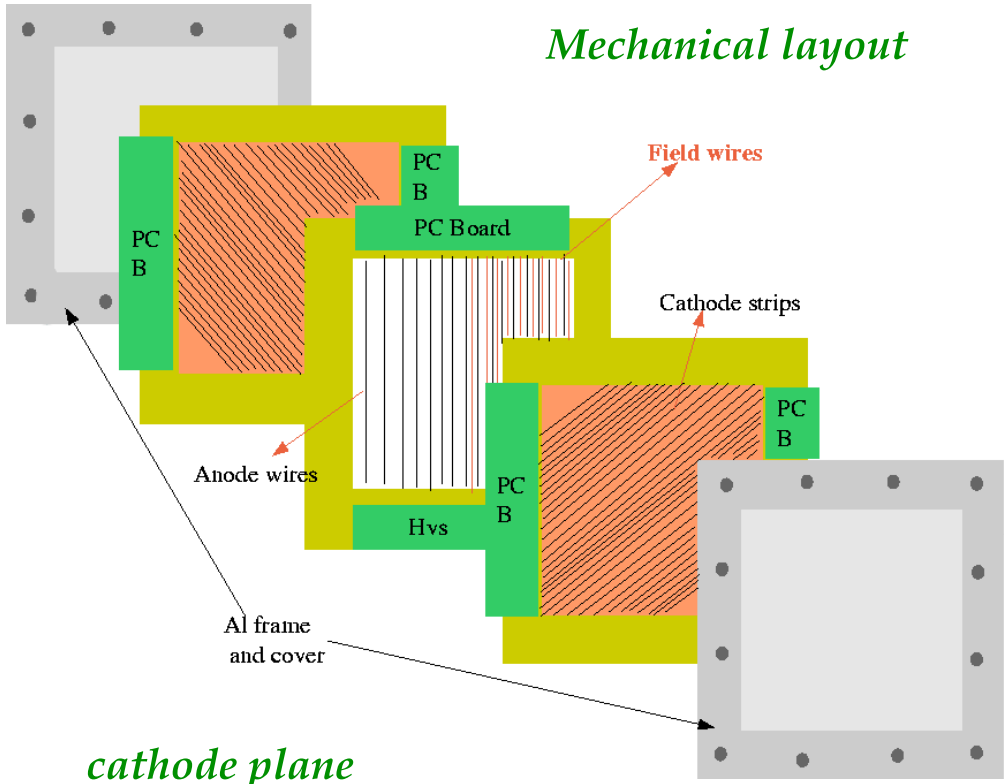
– *Prototype design work completed in June 2003.*

– *All boards and frames are in–hand.*

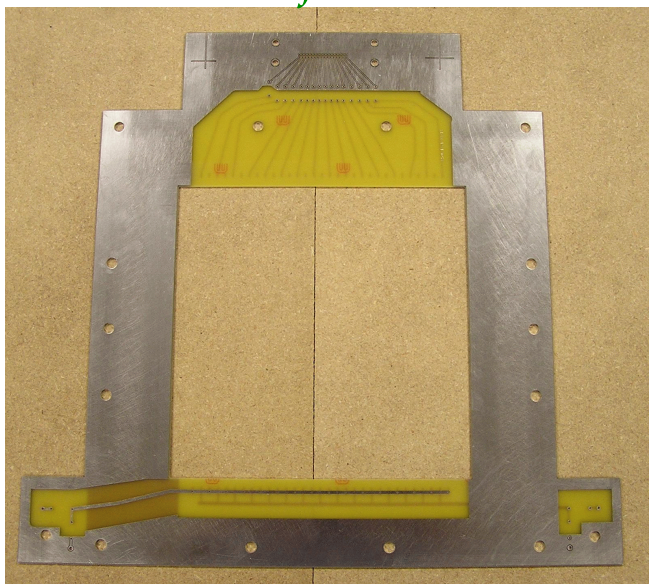
– *Assembly underway.*

– *Full test plan developed.*

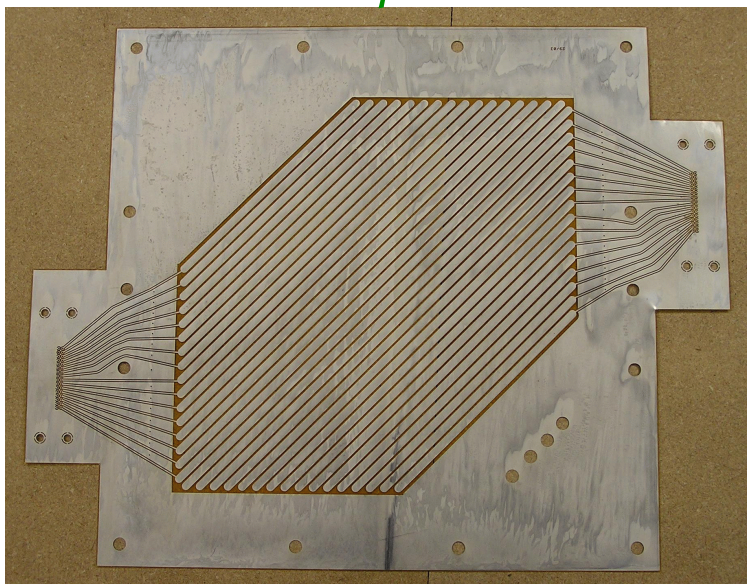
Mechanical layout



wire frame



cathode plane



Questions to Address

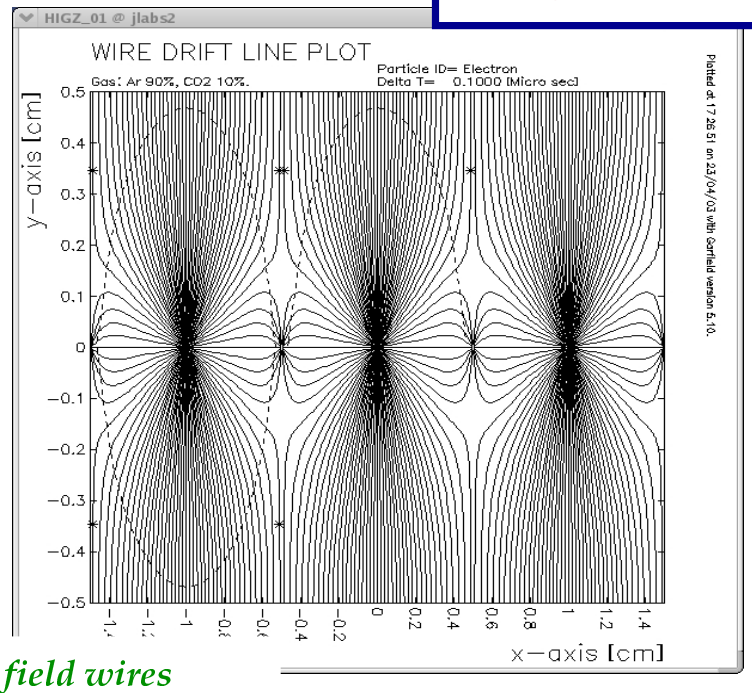
- *Understand trade–offs between position resolution at the cathode plane and timing resolution at the wire plane.*

Basic electrode structure

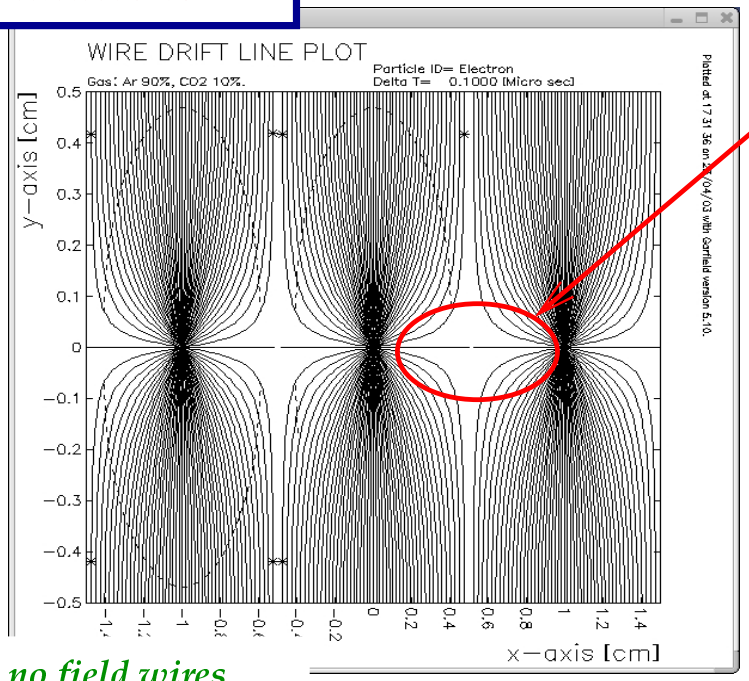
Cathode pitch and separation

Need for field shaping wires

GARFIELD Simulations



field wires



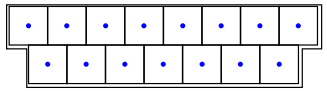
poor time resolution

no field wires

Cosmic Ray Test Stand

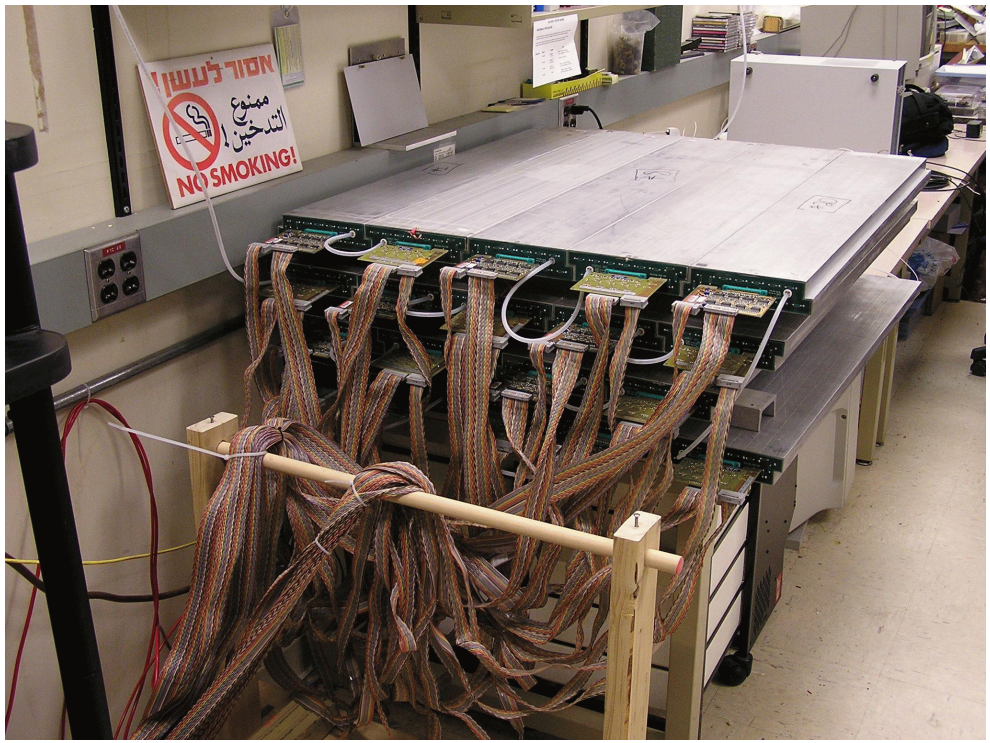
Test stand will be used to measure resolution of FDC prototype.

– *19 chambers on loan from the STAR group at IUCF.*



– *Chambers set up at JLab in EEL Room 126.*

– *Chambers reconditioned after long storage period at IU.*



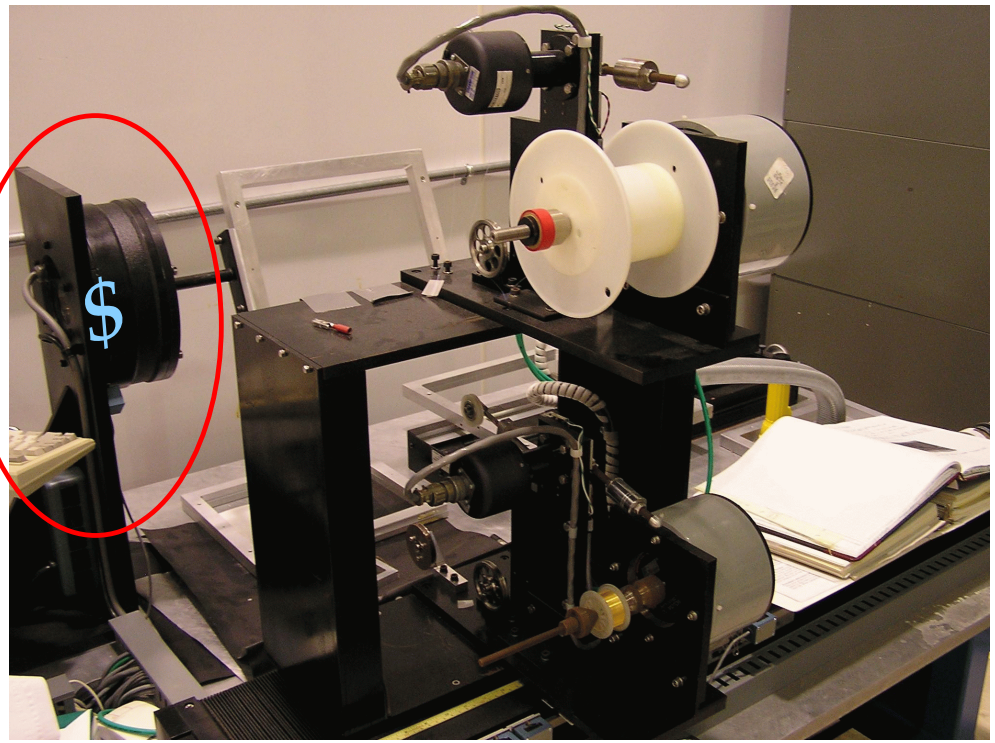
– *DAQ system, readout, and electronics setup is ongoing.*

– *Support/alignment frame for chambers now being designed.*

– *Test stand should be able to define charged tracks through FDC prototype with position resolution of better than 200 microns.*

FDC Prototype Status

Wire winding machine controller "fried" in the aftermath of an electrical storm the day before the planes were to be wound.



Possibilities:

- *Use wire winding machine at CMU.*
- *String "by hand".*

Work just getting underway on prototype assembly and testing.

See the full and complete test plan document for the FDC prototype chamber at:

http://www.phy.ohiou.edu/~carman/halld.html