

The GlueX Central Drift Chamber



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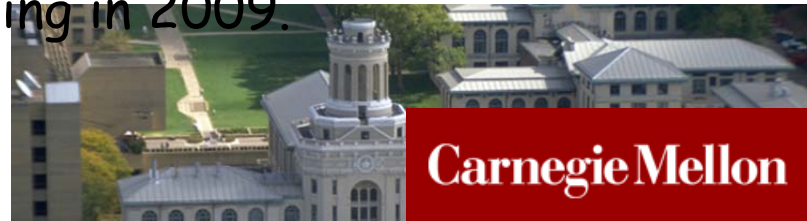
Curtis A. Meyer	Professor	75% Research Time
Gregg B. Franklin	Professor	25% Research Time
Reinhard Schumacher	Professor	Participation in 2010
Matt Bellis	Post Doc	25% Research Time
Yves Van Haarlan [@]	Post Doc	75% Research Time
Gary Wilkin	Technician	up to 100%
Mike McCracken	Grad. Student	20% Research Time
Unnamed	Undergraduate	

Ph.D Thesis Students - The first GlueX thesis students are likely to enter graduate school in 2010 or 2011.

If we have one, we can get a student to work on the prototype.

With start of construction, we will be able to put students on hardware project for 1-2 years starting in 2009.

[@] Started October 1, 2007



Chamber Status

The CDC activity has been fairly low key over the last several months.

- High-voltage feed through for the CDC to be able to mount the preamplifier boards outside the gas plenum.

The chamber is instrumented using 16 channels of 200 MHz Struck Flash ADCs and read out using a VME system and the full version of CODA.

- Prototype H.V. Distribution Boards.
- CLAS Preamplifiers
- We purchased a new VME CPU, but are still using the older version on loan from JLab.



Currently Setup for Cosmic Rays

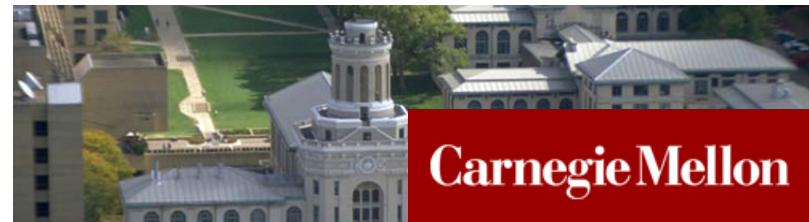


Fitting time using 1st electron and Differential-Center of gravity techniques. Trying to optimize what the best pulse shape would be for optimal time to feed into shaper designs.

Working on algorithm to integrate charge as a precursor to dE/dx measurement.

Looking at noise suppression. Common noise from the current preamplifier.

Generation of time-zeros and drift time spectrum.

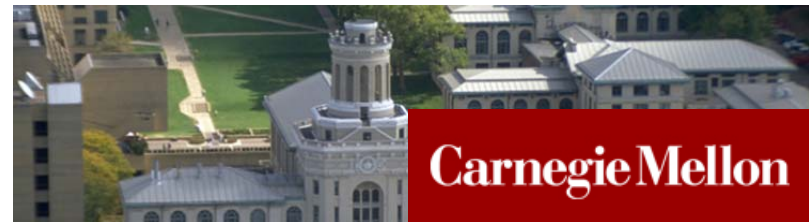


Track Fitting

Once we are happy with the pulse finding and timing, we will move onto track fitting.

Need to (re)generate the radius-to-time relationship using GARFIELD. Turns measured drift time into a distance away from the wire.

We have up to eight samples along a track, so doing track fitting can yield resolutions of the chamber.



Studies to be Done

Crossing Angle of tracks - tilt the chamber.

Gas Mixtures - mix in some methane or ethane.

Charge Division on the wires.

These can be carried out with the help of an undergraduate once the necessary program and software are in place.



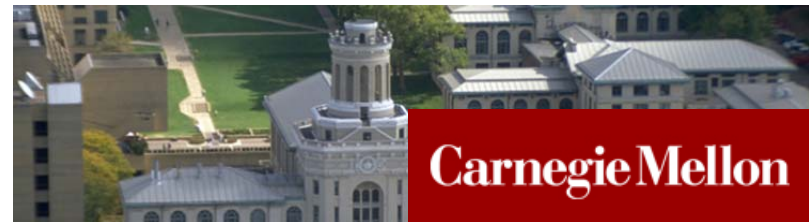
Small Prototype

We want to build a small (an portable) prototype using the materials and parts that we plan to use in the final chamber.

- Transfer construction expertise.
- Final check for issues with modified parts.
- Chamber could easily be used in either a beam or a magnetic field test.

Can be done in parallel with other work once the analysis tools Are in place and stable.

All parts either exist or can be built in house for this chamber.



Design Work Remaining

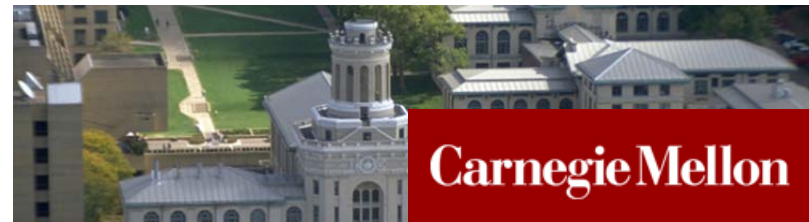
There is currently a global optimization between the CDC and The FDC taking place.

Over the last 2 years, the CDC has been shortened from 2m to 1.5m and has shifted in by about 5cm in radius.

What is the optimum number of FDC packages?

If it is 3, should we lengthen the CDC back to 2m?

How much space should be left between the CDC and BCAL (possible future PID detector)?



CDC - Start of Construction

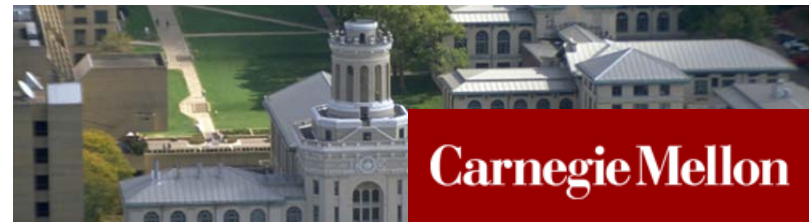
According to the current "book", we anticipate starting to order material for the CDC in January 2009.

- (* Endplates
- (* Straw tubes
- (* Feed throughs
- (* Crimp Pins
- (* Donuts[@]
- (* Wire
- (* Glue

Other things needed later in the process
 Plenum Material
 HV Distributiou boards + parts

Clean-room setup: We have asked DOE for infrastructure funds to set up a clean area in one of our labs. Not specifically 12GeV.

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Moving Forward

The CMU group's manpower situation has finally recovered from the cuts in 2006.

Yves Van Haarlan started October 1st and has been working 200% to get up to speed on the CDC.

A 2nd senior postdoc will start in January with significant CODA expertise.

A 3rd postdoc as part of our Physics at the Information Frontier proposal is likely to start in January. This would be on Partial Wave Analysis.

We will be looking for undergraduates (one in mind right now) to start helping Yves once he feels ready.

