

E907 Experimental Status

A.Norman, E907 Collaboration

10, January 2005

FNAL E907 Collaboration

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Introduction

- Power Outage Recovery
- Spectrometer Commissioning
- Beamline Commissioning
- Physics Running Prep
- Run Plan

Power Outage Recovery

Recovering from the series of power outages was non-trivial.

A number of key systems entered their fail-safe modes during the extended outages. This resulted in:

- Purge of the RICH PMT enclosure
- Venting of drift chamber volumes
- Loss of roughly 10lbs of C_4F_{10}
- VESDA alarms and interlocks etc....

Additionally the unstable power caused failures in

- TPC Gating Grid (GG0 High/Low)
- TPC Trigger electronics (gate/delay module)
- Target Wheel controls failure (ACNET related)
- Chamber front end electronics (DC discrim, preamps, etc...)

Recovery/Commissioning

Down time was used to reset and repair systems as well as perform scheduled maintenance on the detectors and front-end electronics.

- Threshold Čerenkov timings and diagnostics finalized.
- Time of flight systems repaired and tuned.
- Trigger logic in crate 11b-NIM2 rebuilt due to identified inconsistencies.
- Trigger enhancements and diagnostics were added.
- Faulty trigger latch module pulled, replaced, and verified.
- Subtle problems in pion ID were traced to a bad coincidence module (replaced).
- Trigger timings alignments adjusted for consistency (1-3ns).

We came back on the air Wednesday morning at 10:00

Commissioning

Since coming back on the air we have continued the final phases of commissioning including:

- Trigger efficiency and timing studies
- Čerenkov calibration studies
- Time of Flight studies
- Chamber efficiency studies (Drift Chambers, Proportional Chambers)
- TPC voltage studies
- Thick target interaction studies (3% Ag).

Commissioning (cont.)

On 7Jan05 and 10Jan05 we were open for tech access.

- Interlock doors on MC7 main entrance were repaired!!!!
- Spectrometer magnet fringe fields were measured.
- Low voltage power supply repaired
- Work on gas lines and manifolds
- Snow removal (a fringe benefit)
- Final Chamber survey and alignment

Beamline

We have exercised the beamline tunes from 15GeV/c-60GeV/c. The tune now yields an acceptable beam spot at most energies as well as low divergence through the Čerenkov counters.

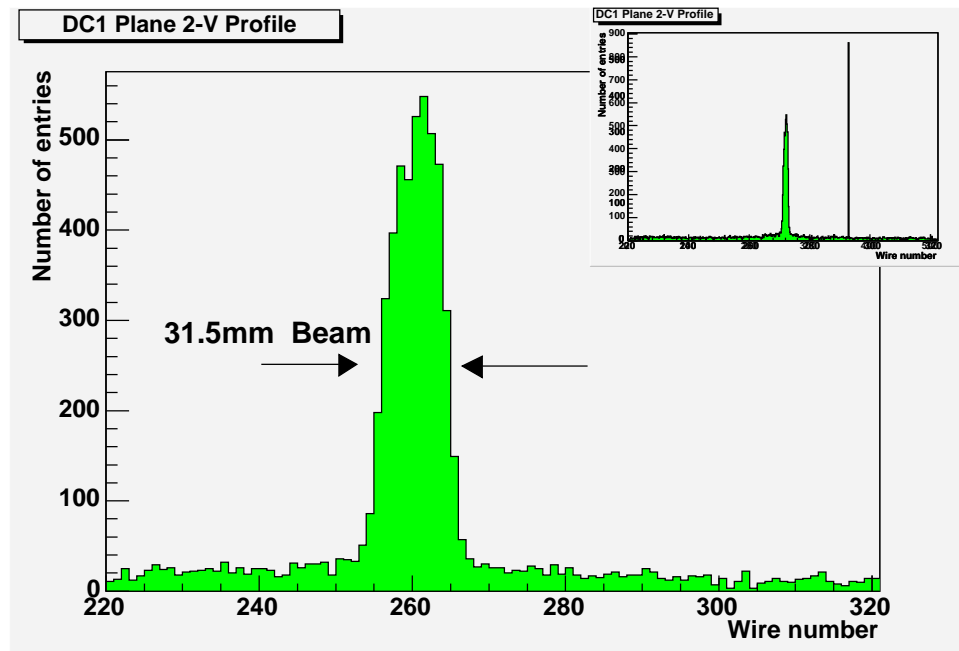


FIG. 1: Drift chamber 1 beam profile

Beam ID

- Beamline tagging purities and systematics have been determined for the available momenta ranges.
- All beam tags are within expected tolerances for established tunes.
- More analysis is required for low and high \vec{P} .

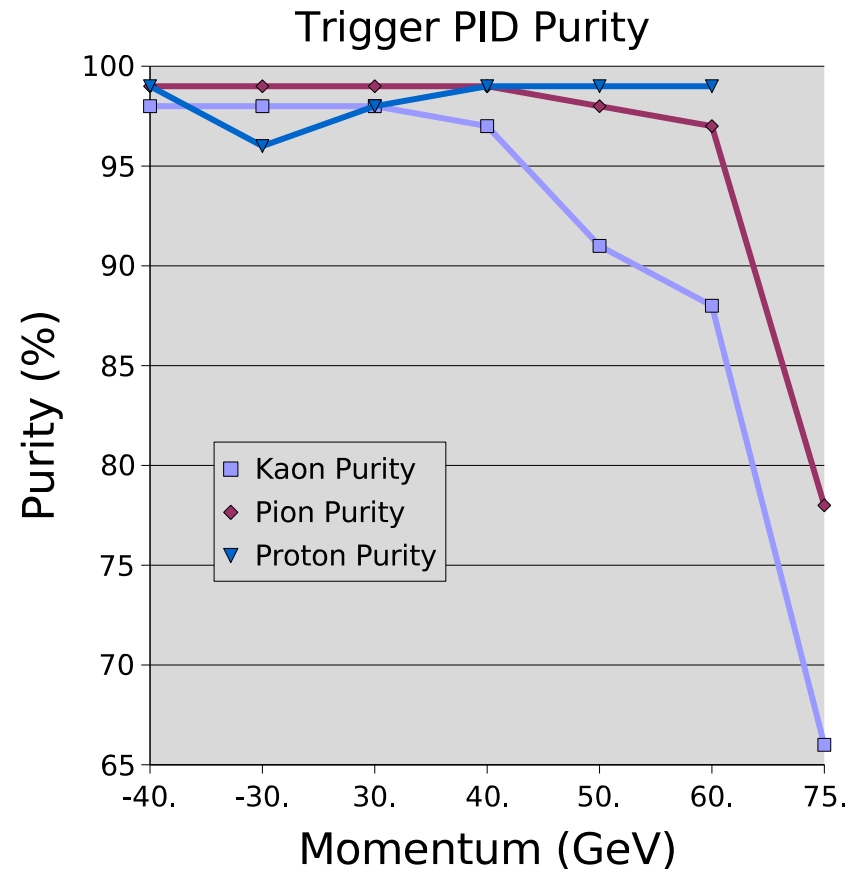


FIG. 2: Particle ID Trigger Purity

Target Selection

The thin target assembly has been rigged for the initial running period due to delays in the installation of the cryo target.

Current we are prepared to run on:

Material	Int. Len.	Rad. Len.
Ag	3.15%	31%
Be	0.94%	1.1%
C	0.94%	1.9%
Al	0.99%	4.4%
Bi	0.87%	27%
Cu	0.97%	10%

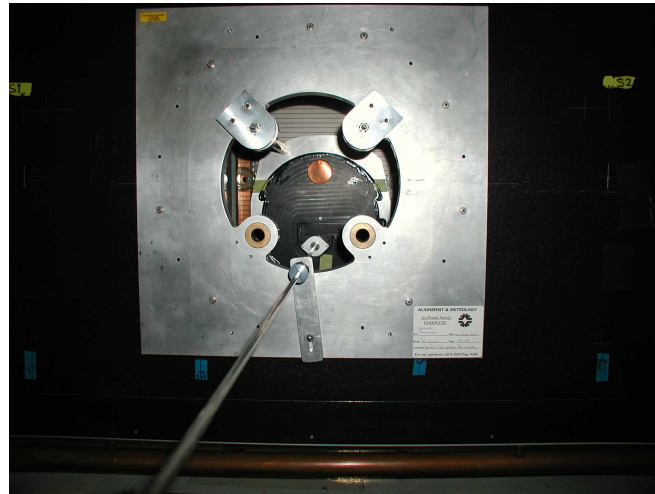


FIG. 3: E907 Target Wheel

- Au and DU are in procurement from LLNL.

Physics Running Prep

We are running with full physics trigger selections live:

- Minbias
- Particle ID Tagging Minbias
- Particle ID Tagged Interactions
- Calibration Triggers
- Systematic Studies Triggers
- User Triggers (alt. interaction)

We are determining the required and optimal beam intensities and prescales to correctly saturate our DAQ while preserving minority particle ID and interactions.

TPC Run Prep

The Time Projection Chamber is operational.

- 80% of the anodes are at full operating voltage and stable.
- Gating Grid is stable.
- Front end electronics are stable.
- DSPs are stable.
- Readout is stable.
- We see tracks
- We fit tracks
- We reconstruct vertexes

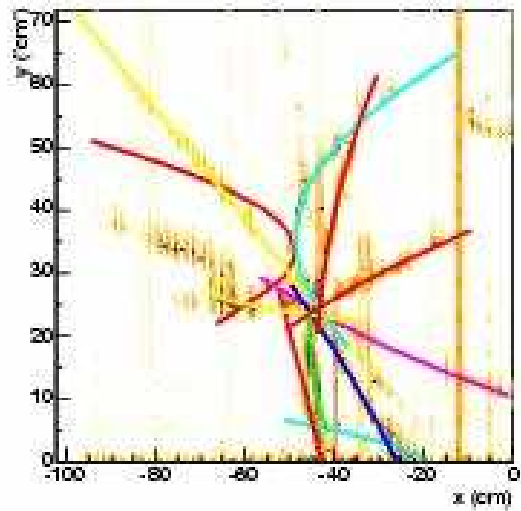
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SubRun: 0
Event: 53

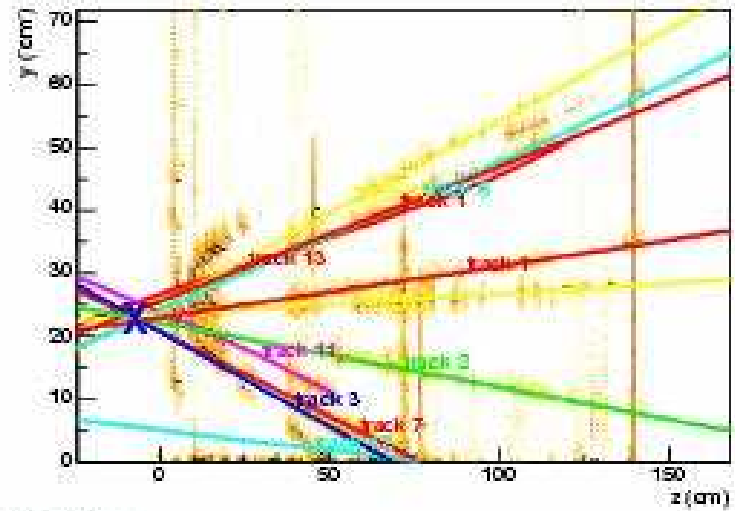
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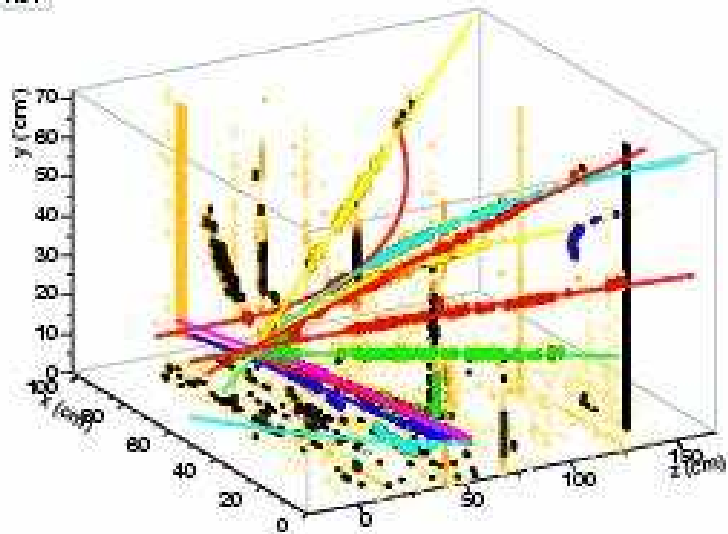
TPC Front



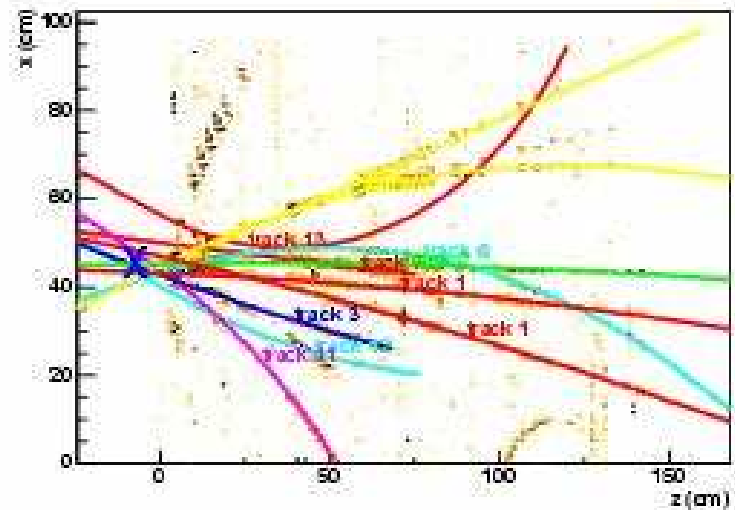
TPC Side



n31



TPC Top



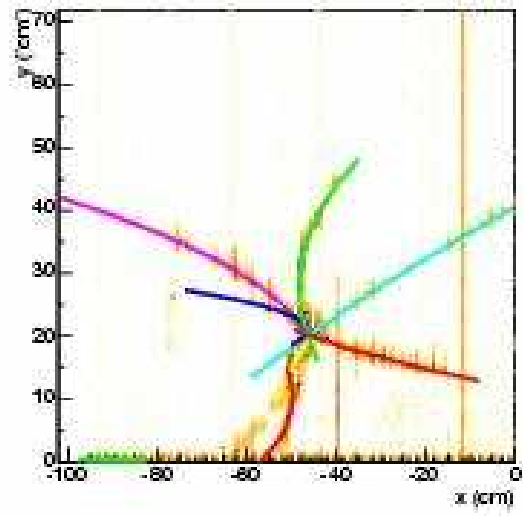
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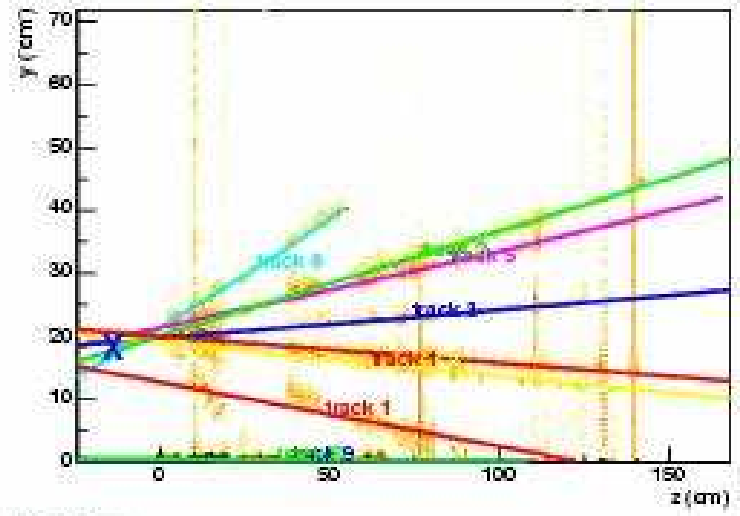
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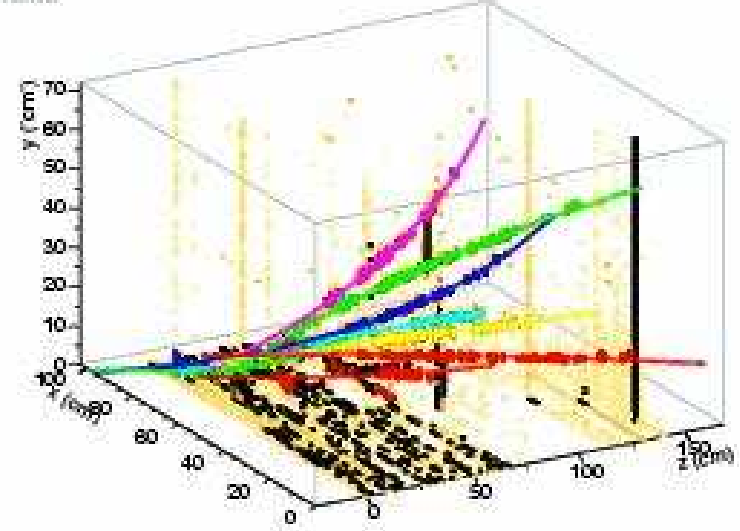
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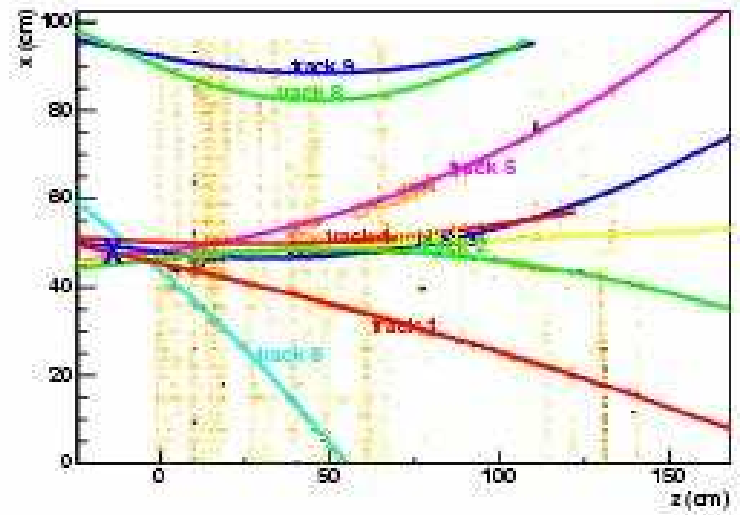
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TPC Top



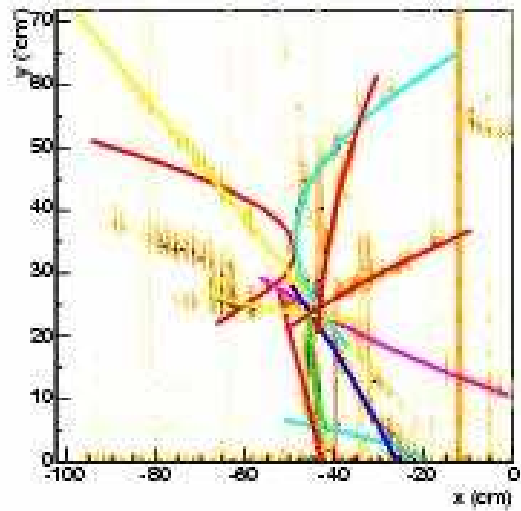
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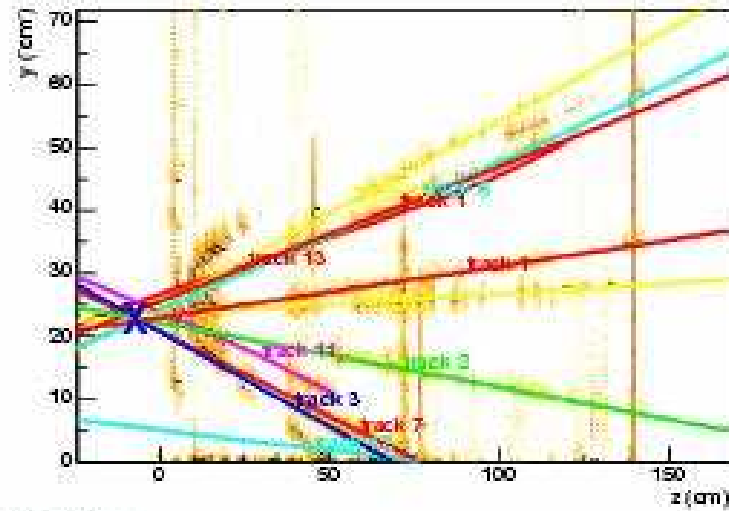
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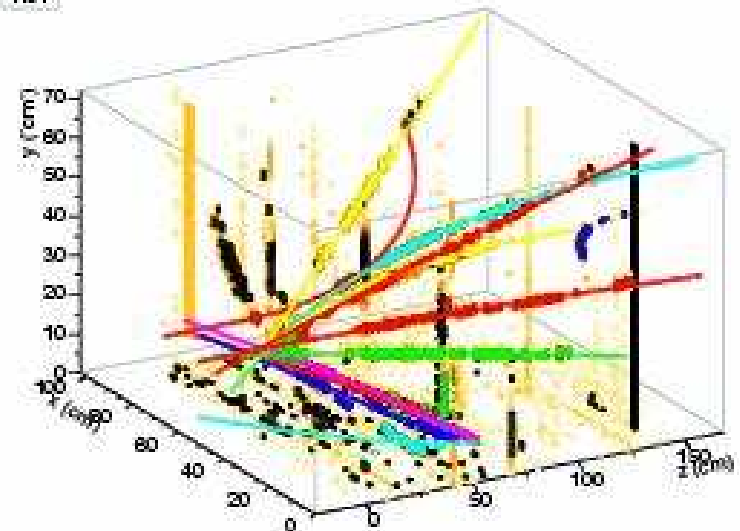
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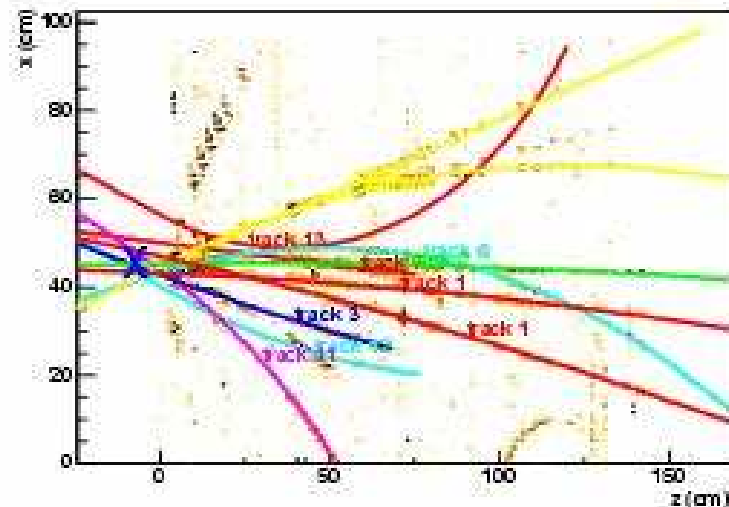
TPC Side



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TPC Top



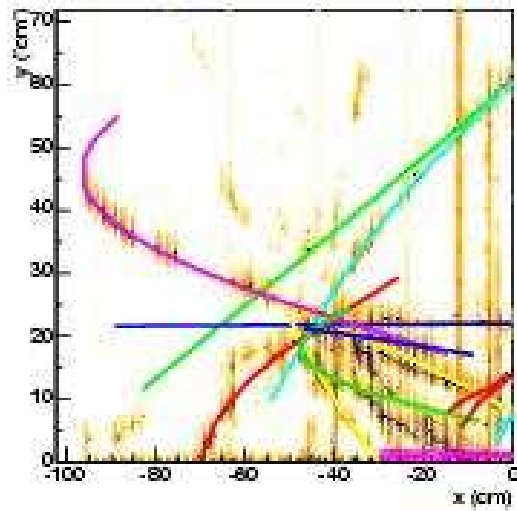
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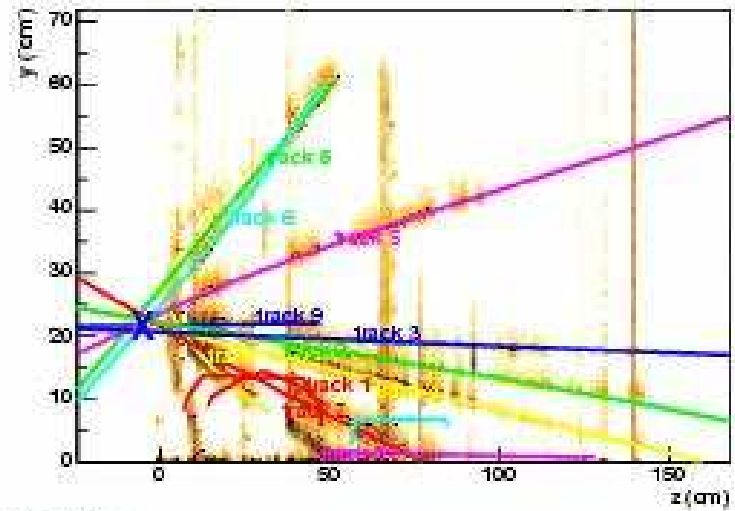
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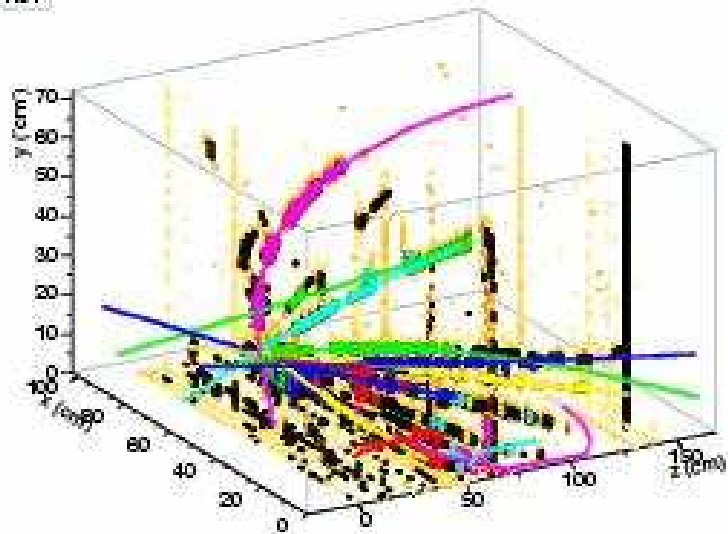
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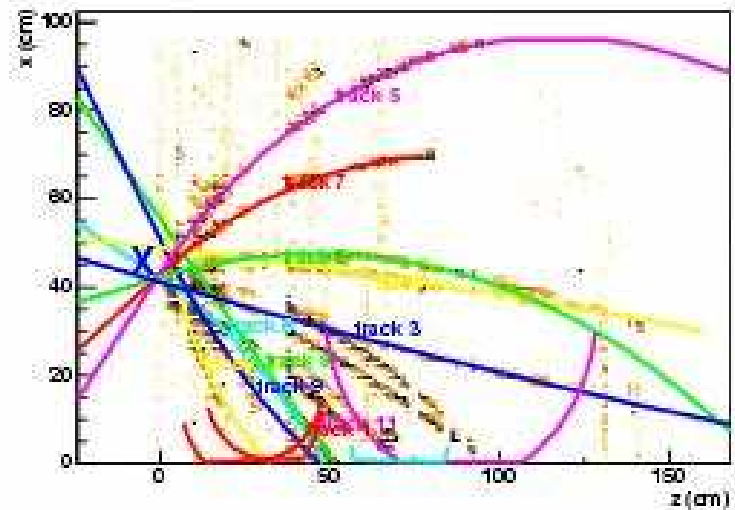
TPC Side



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TPC Top



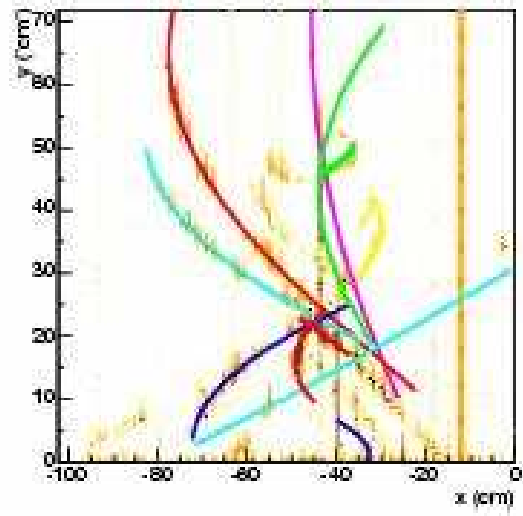
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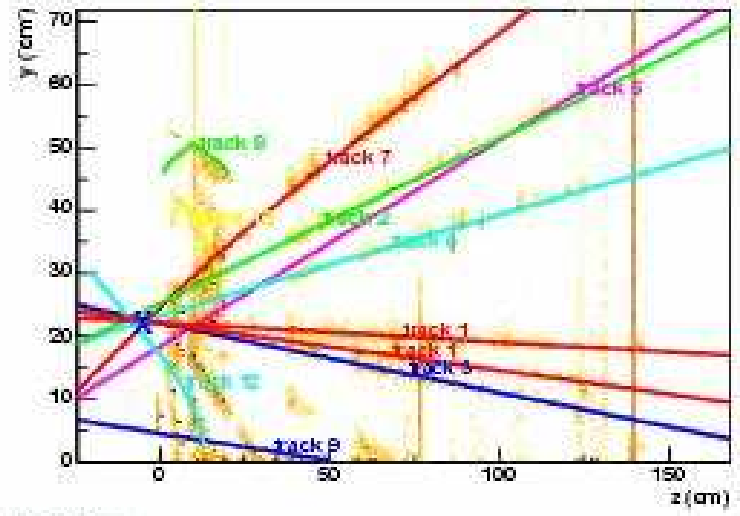
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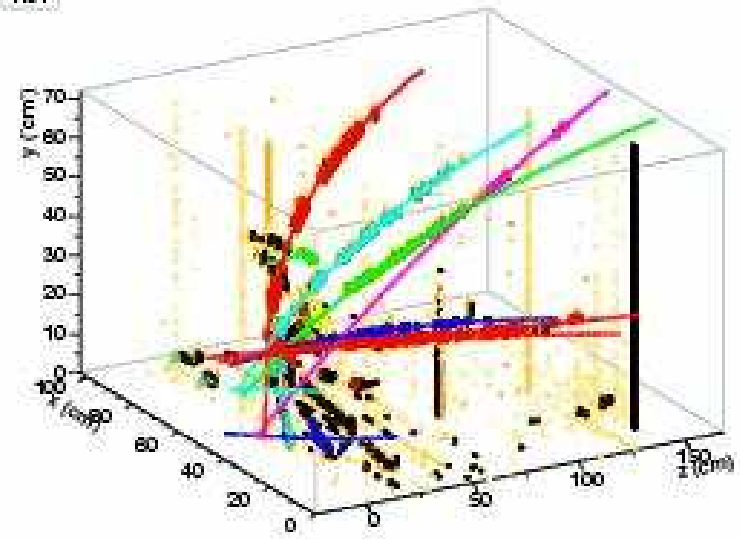
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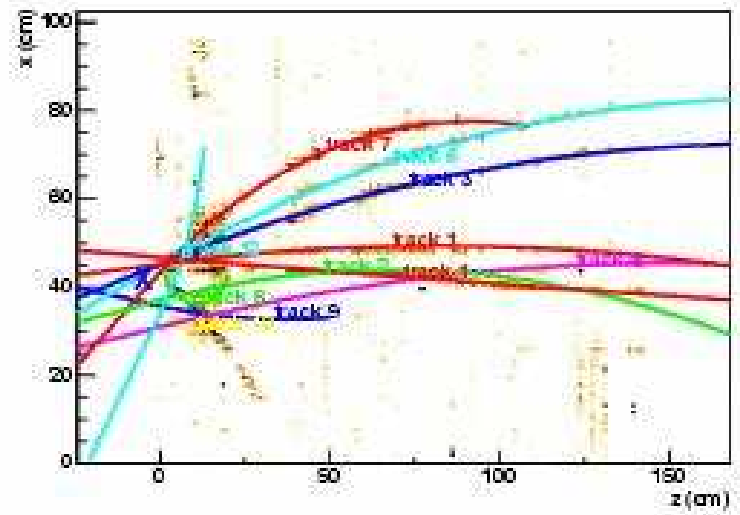
TPC Side



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TPC Top



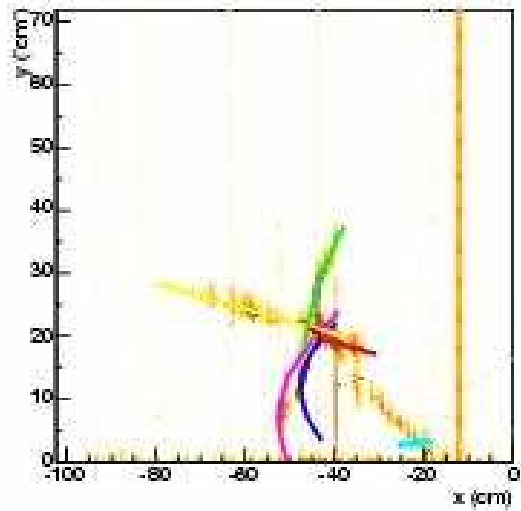
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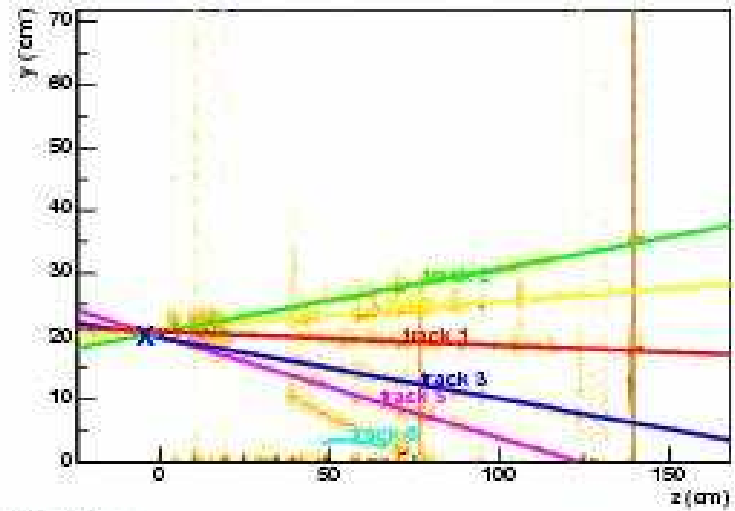
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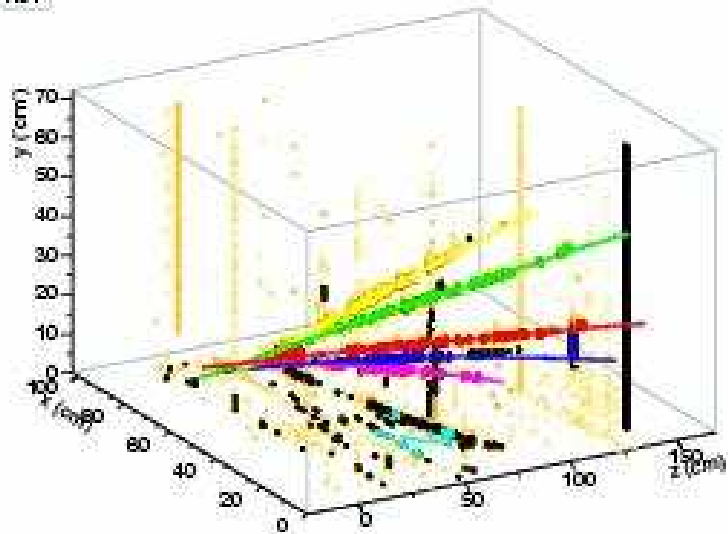
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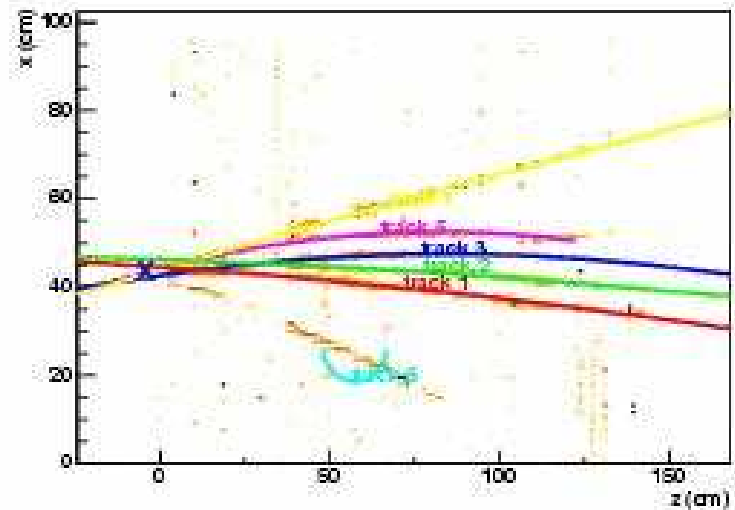
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TPC Top



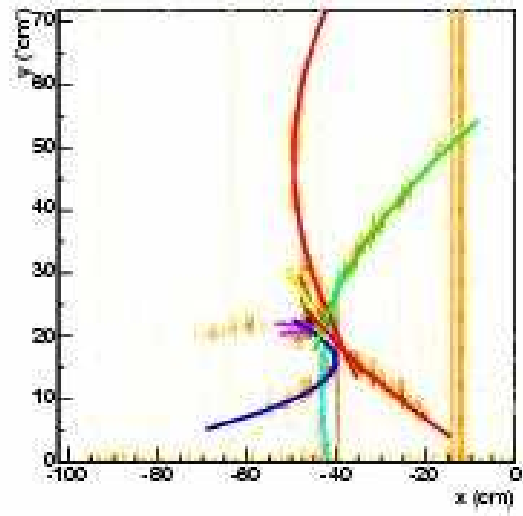
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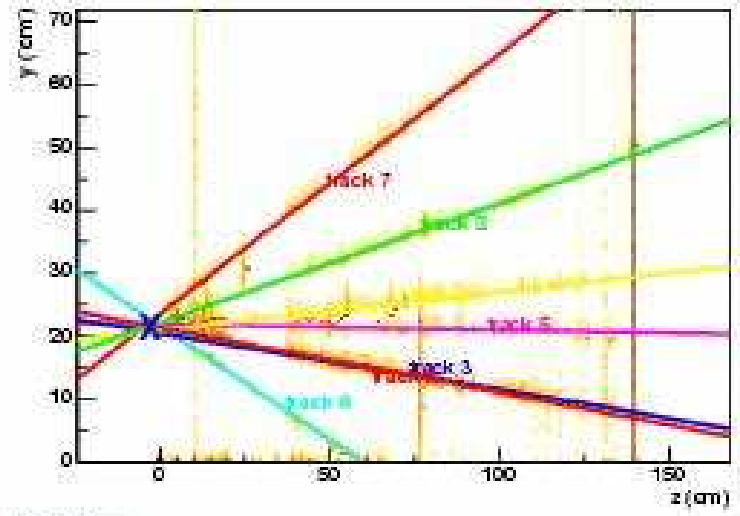
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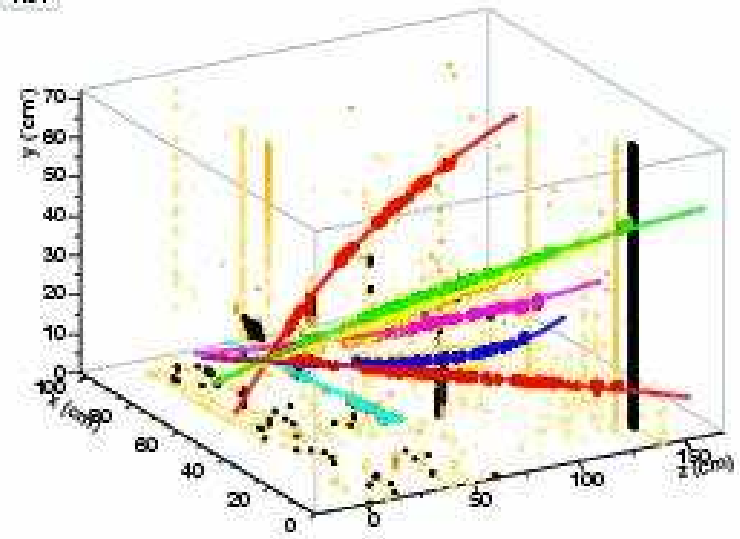
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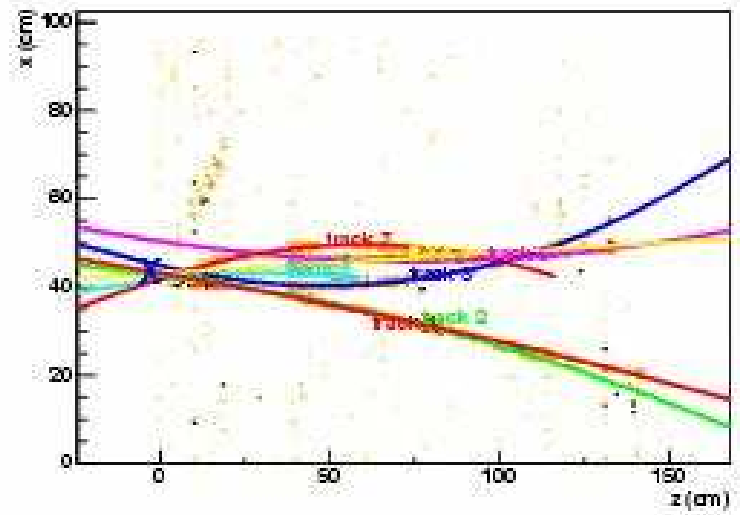
TPC Side



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TPC Top



This Week (10Jan-17Jan)

We still have outstanding issues.

- Beam Chamber 3 broken wire (LLNL)
- Proportional Chambers RMH Readout and Gas Gain (Iowa)
- Target wheel controls (FNAL)

We must continue calibration and systematic studies to finalize and fine tune the trigger systems, particle ID and chamber tracking.

Run Plan

- 10Jan-13Jan Calibrations on 3% Ag for high multiplicity final states
- 13Jan-16Jan Calibrations on 1% Be for low multiplicity final states
- 17Jan Start phase 1 physics running on Be, C, Al, Cu, Bi.