STAR FTPC and Run V

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February 23,2005

Outline

- I. FTPC parameters in Run V
- II. Operational Status
- III. Calibration Status
- IV. Summary

FTPC Group

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- Alexei Lebedev (BNL)
- Markus Oldenburg (LBL)
- Jörn Putschke (MPI)
- Janet Seyboth (MPI)
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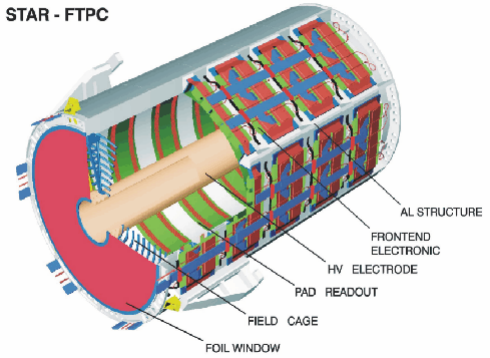
- Frank Simon (MPI)
- Brijesh Srivastava (Purdue)
- Terry Tarnowsky (Purdue)



Thanks to:

Michael DePhillips

Lidia Didenko

Eric Hjort

Jerome Lauret

Jeff Porter

……

For invaluable technical support!

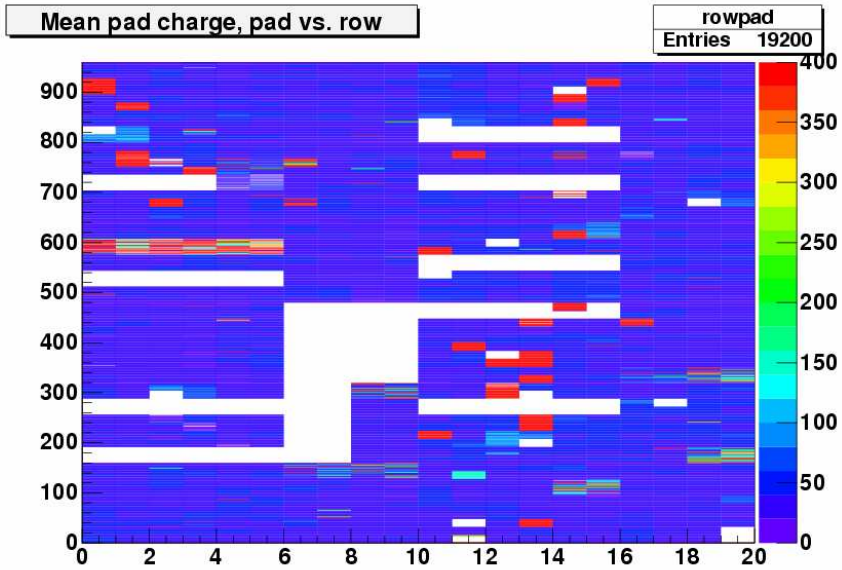
Run Parameters

- FTPCs operational for both Cu-Cu and upcoming pp running.
  - Cu-Cu:
    - 200 GeV, 62.4 GeV, injection energy.
  - pp:
    - 200 GeV polarized, 500 GeV (?).
- Based on cluster properties, anodes at 1775 V for 200 GeV Cu-Cu
- Early data taken at 1800 V. Change is mostly transparent to end users.
- Appropriate settings for other energies/species TBD from initial data.

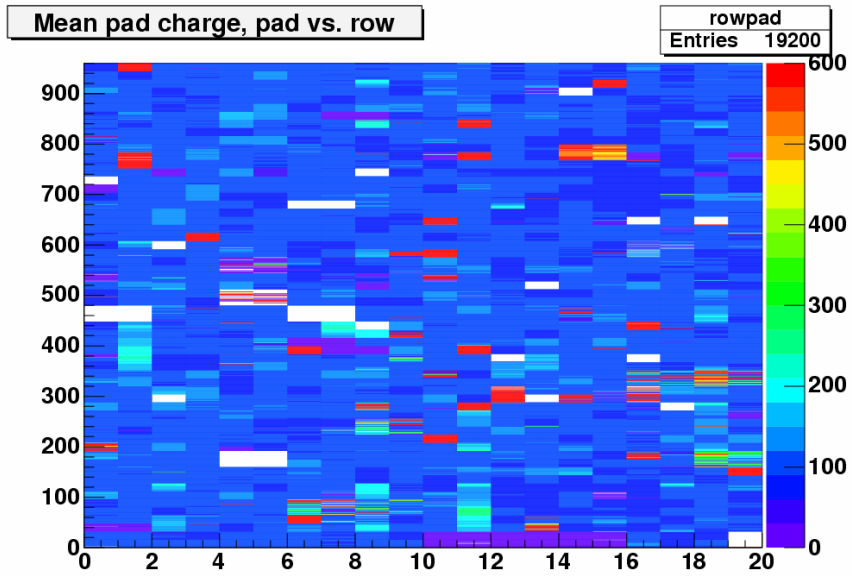
Electronics

- Alexei Lebedev installed protection boards for all FTPC FEEs during summer shutdown.
  - Purpose was to mitigate destructive energy discharge to pad plane during anode trip.
  - All FEEs retrofitted.

Electronics II

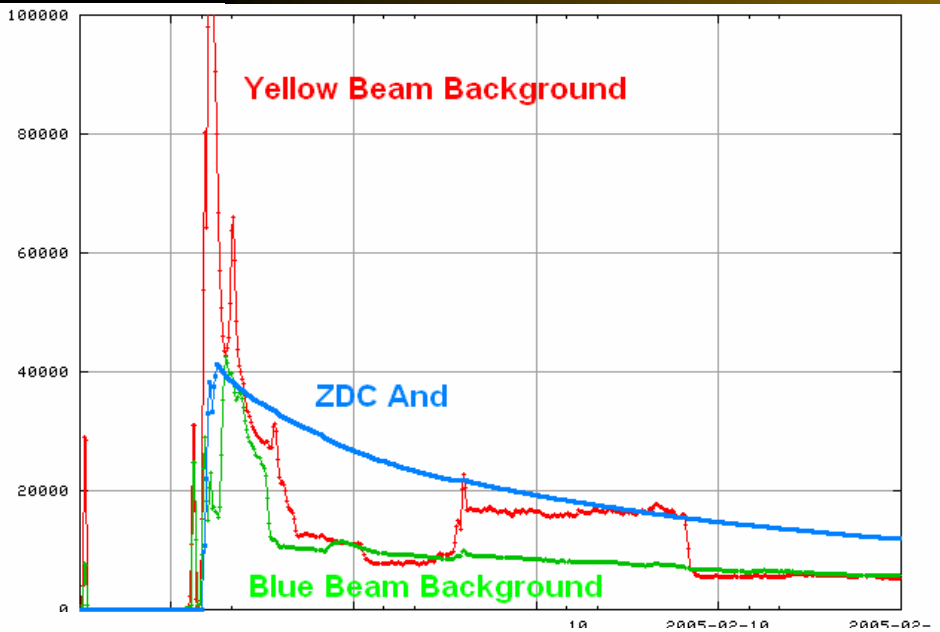


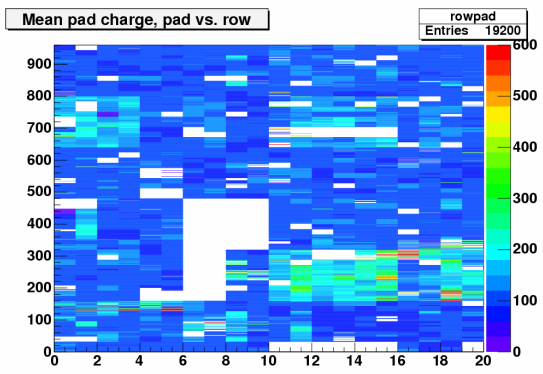
Status @ end of Run IV



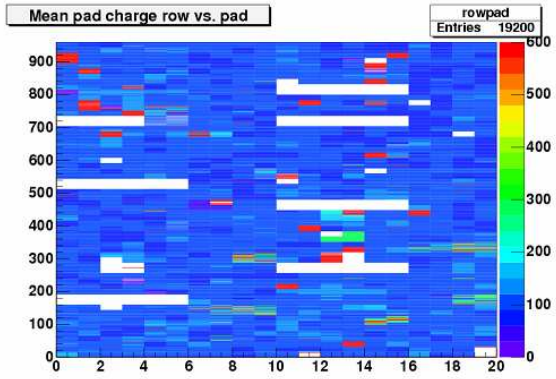
Status @ start of Run V

Electronics III





Run V, Day 041



Run IV, Day 053

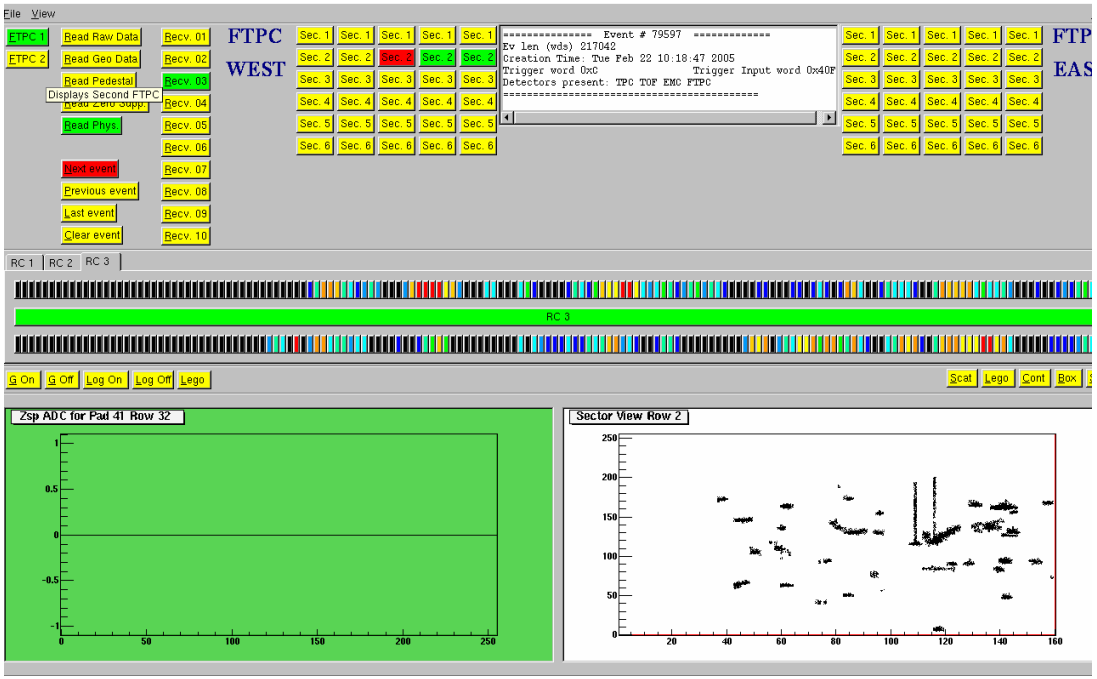
- Beam backgrounds very high in this Cu-Cu run fairly frequent anode trips.
- Fewer large scale losses compared to this time in Run IV.
- Electronics more stable and reliable .

Extra Temperature Sensors

- During summer shutdown additional FTPC body temperature sensors installed.
  - Improves detector reliability. Accurate temperature readings are ***essential*** to reconstruction.
  - New sensors operate on a completely autonomous system (no readout through FTPC RDOs).
    - » **Even if original temperature readings are non-functioning, new sensors provide temperature readout.**

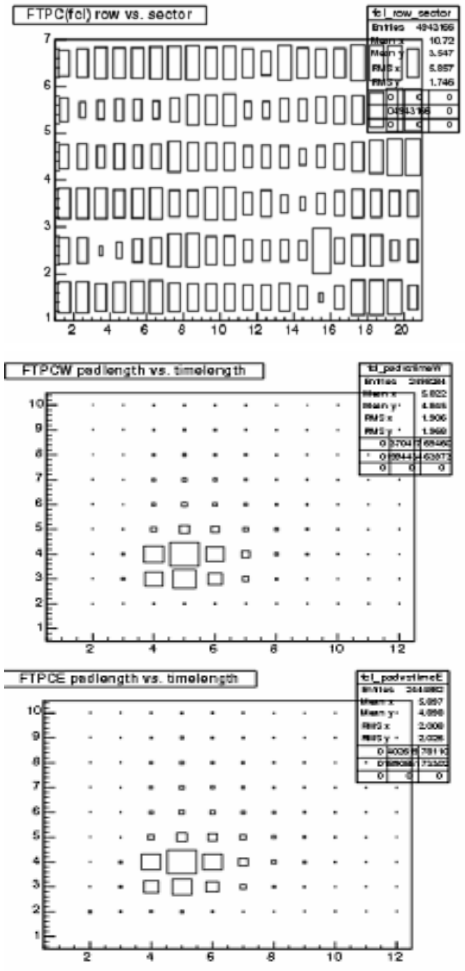
Gain Scan

- Data runs w/ anode voltages ranging from 1725-1825 V.
- Compare cluster and charge distributions.
- Compare cluster r, ϕ residuals.
- View raw clusters as function of pad vs. time using FTPC Pad Monitor.

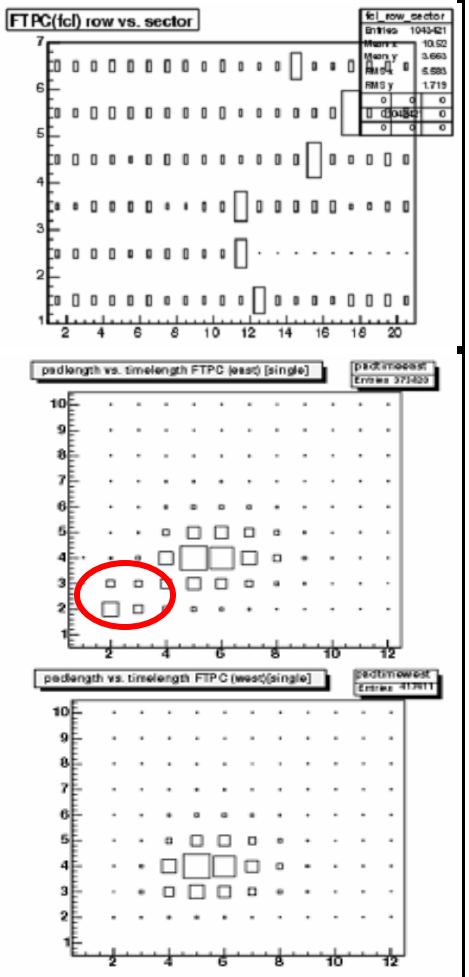


Gain Scan II

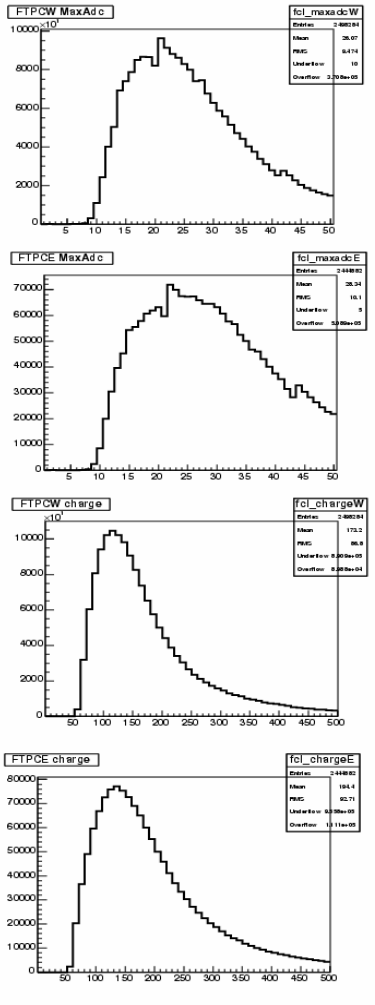
AuAu 5033089, 1775 V



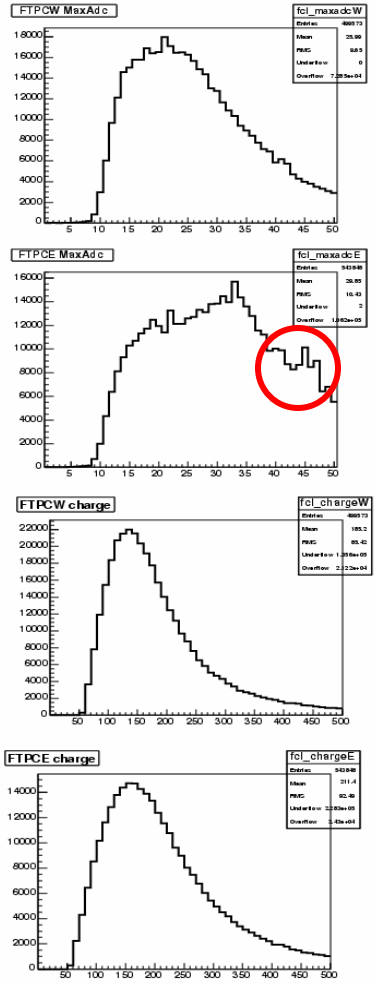
CuCu 6012007, 1775 V



AuAu 5033089, 1775 V

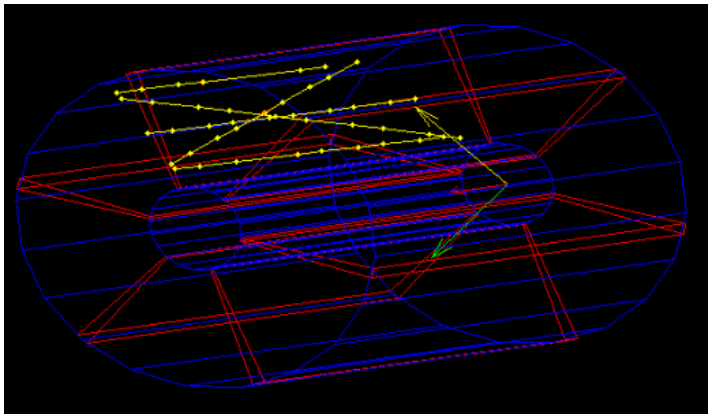


CuCu 6012007, 1775 V



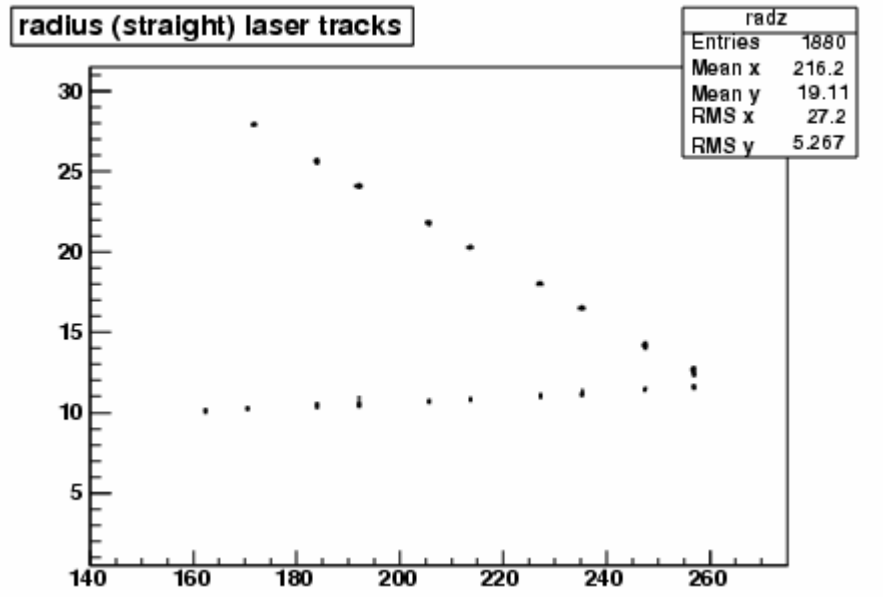
Laser Calibration

- FTPC uses lasers to check drift velocity, t_0, and $\vec{E} \times \vec{B}$ corrections.



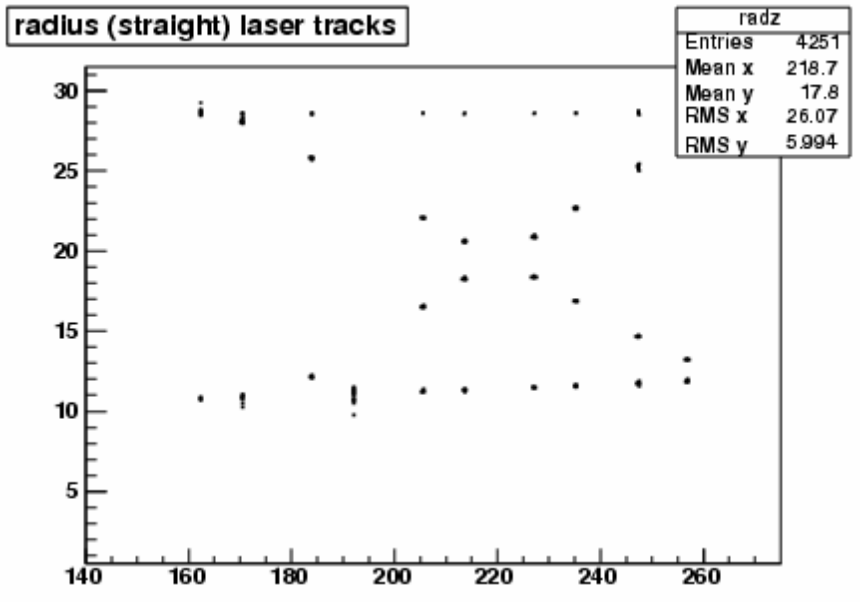
- This requires (bare minimum):
  - Inner and outer straight tracks.
  - One inclined track.

Laser Calibration II



Laser run 6034019, 1200 V

Laser run 6048026, 1400 V



Along with gain, alignment can be adjusted.

Laser Calibration III

- Unlike the TPC, FTPC does not continuous laser runs for calibration.
  - Only need one (minimum) “good” run for calibration purposes.
  - More is always better (of course!)
- Work in progress. Odds of success relatively high.

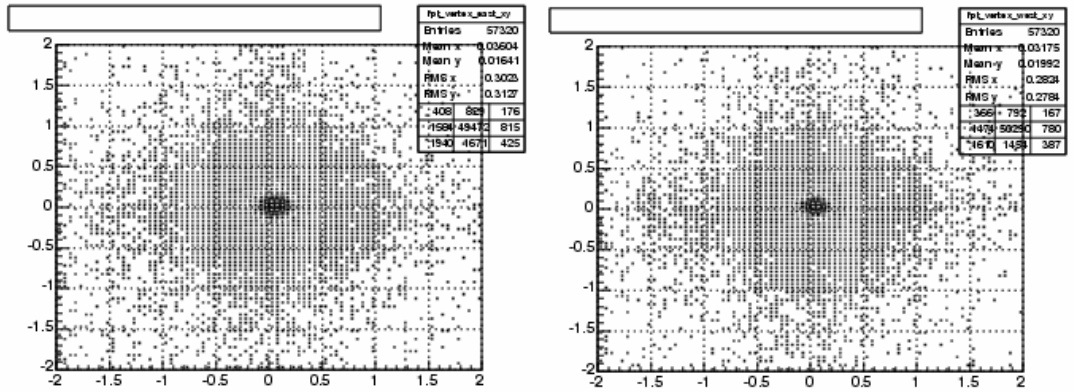
Transverse Vertex Offset

- Align FTPC x,y vertex position w/ TPC vertex.
  - Requires completed TPC calibration and fixed vertex.
- In Run IV data, a B-field dependent effect led to the calculation of offsets after every field change

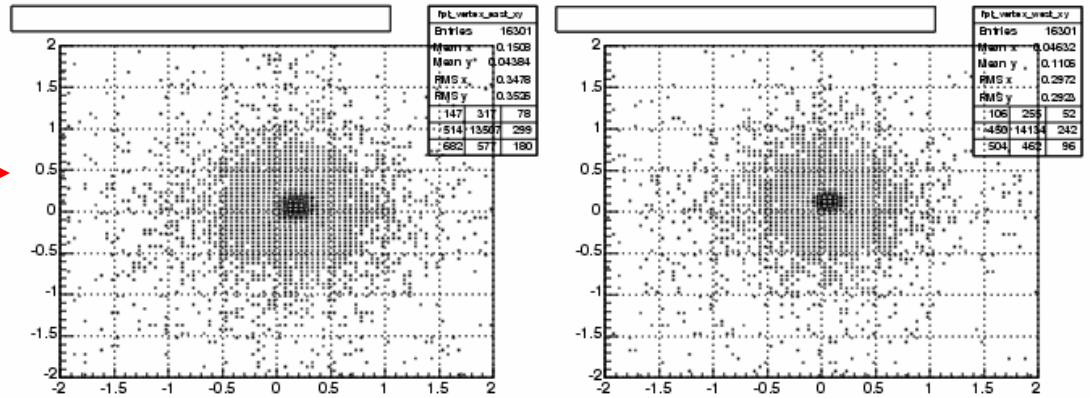
Vertex Offset II

- Initial Run IV offset calculated from RFF data only.

Produced RFF data OK



Produced FF data shows uncorrelated shift in x or y.



Vertex Offset III

- After correcting for each specific B-field configuration, x,y vertex position is OK.
- For Run V, will repeat this procedure.
- Cause of field dependent effect still unidentified, but additional corrections more thorough anyway.

Future Improvements

- Will receive two, 40x70mm SSD modules to install at a fixed position between FTPC body and electronics.
- This absolute position reference will allow independent verification of drift velocity and t_0 measurements.
- SSD group has graciously provided modules and use of their readout electronics.

- Installation planned for Summer 2005.

Summary

- FTPCs are operating well, no major problems to report.
- Some difficulty achieving good laser tracks, but work on alignment will continue.
- Improvements to FEEs and temperature measurement provide valuable extra reliability more useable data!
- Future improvements (such as fixed position SSD modules) will add another level of reliability to calibration process.