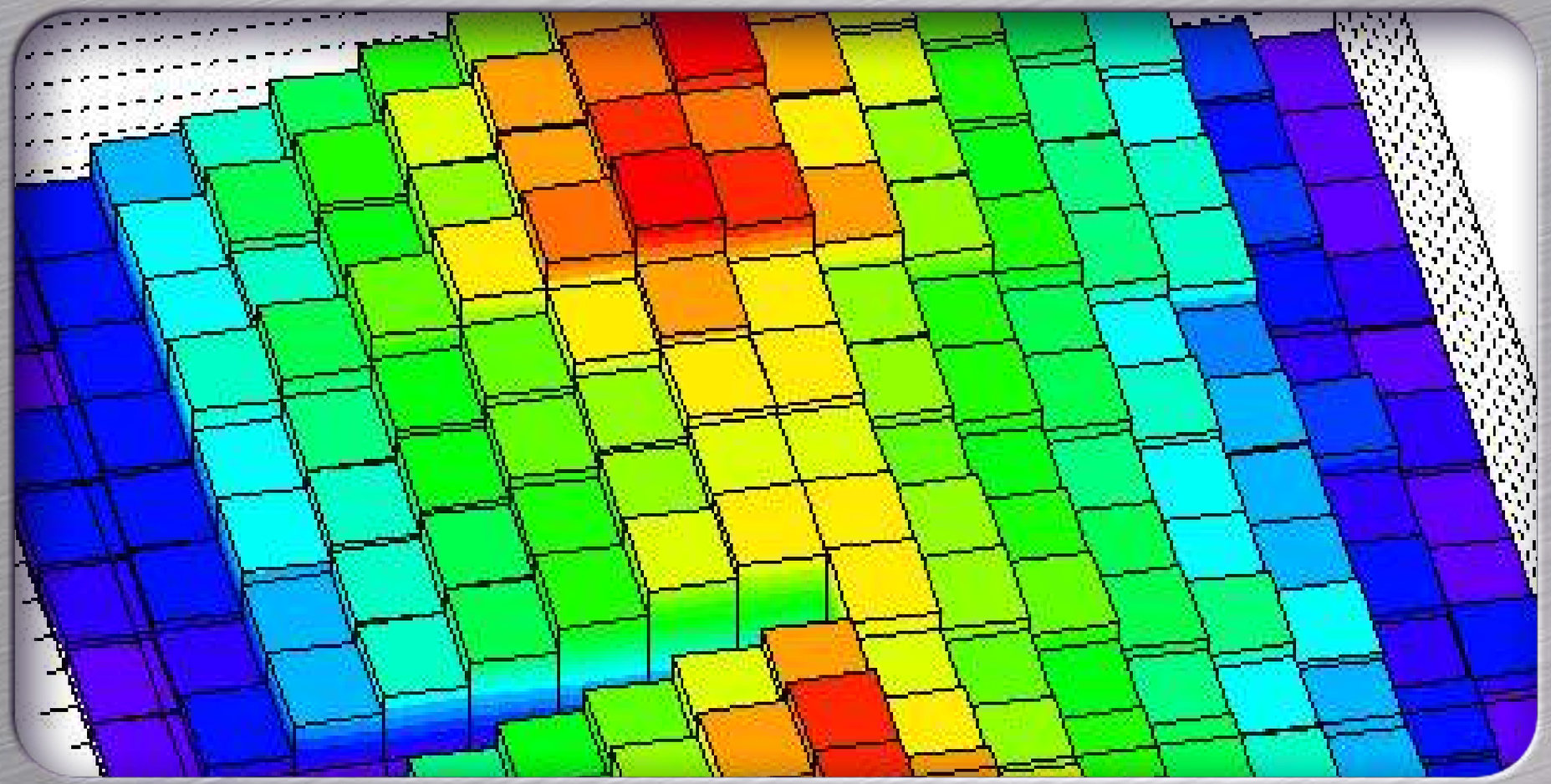
STAR Collaboration Meeting
BNL - Feb. 23, 2005

Gene Van Buren
Brookhaven National Lab



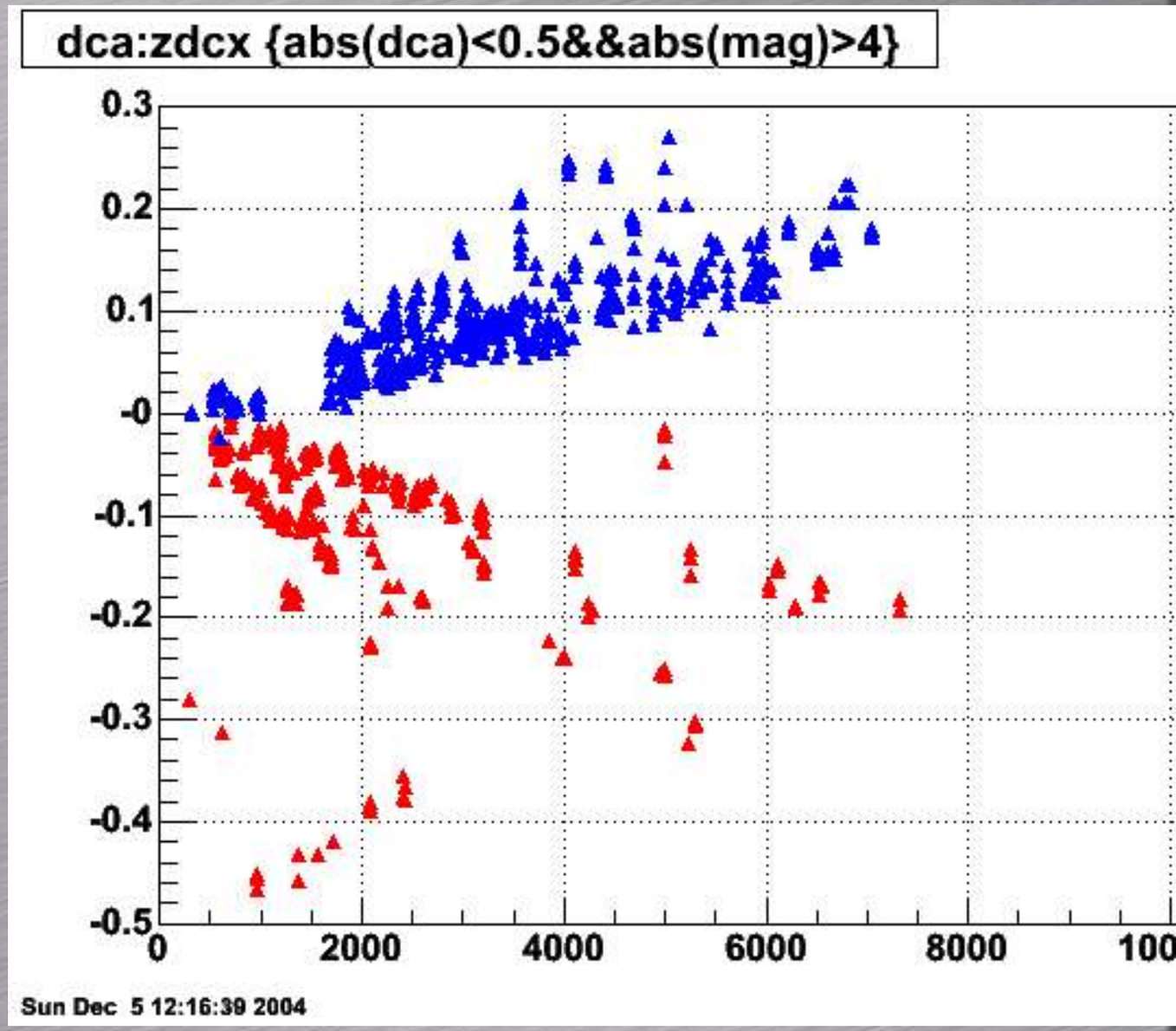
STAR Calibrations

Outline

- 2003 issues
  - SpaceCharge in dAu
- 2004 issues
  - GridLeak
- 2005 issues
  - Preparing for CuCu production
- Future?

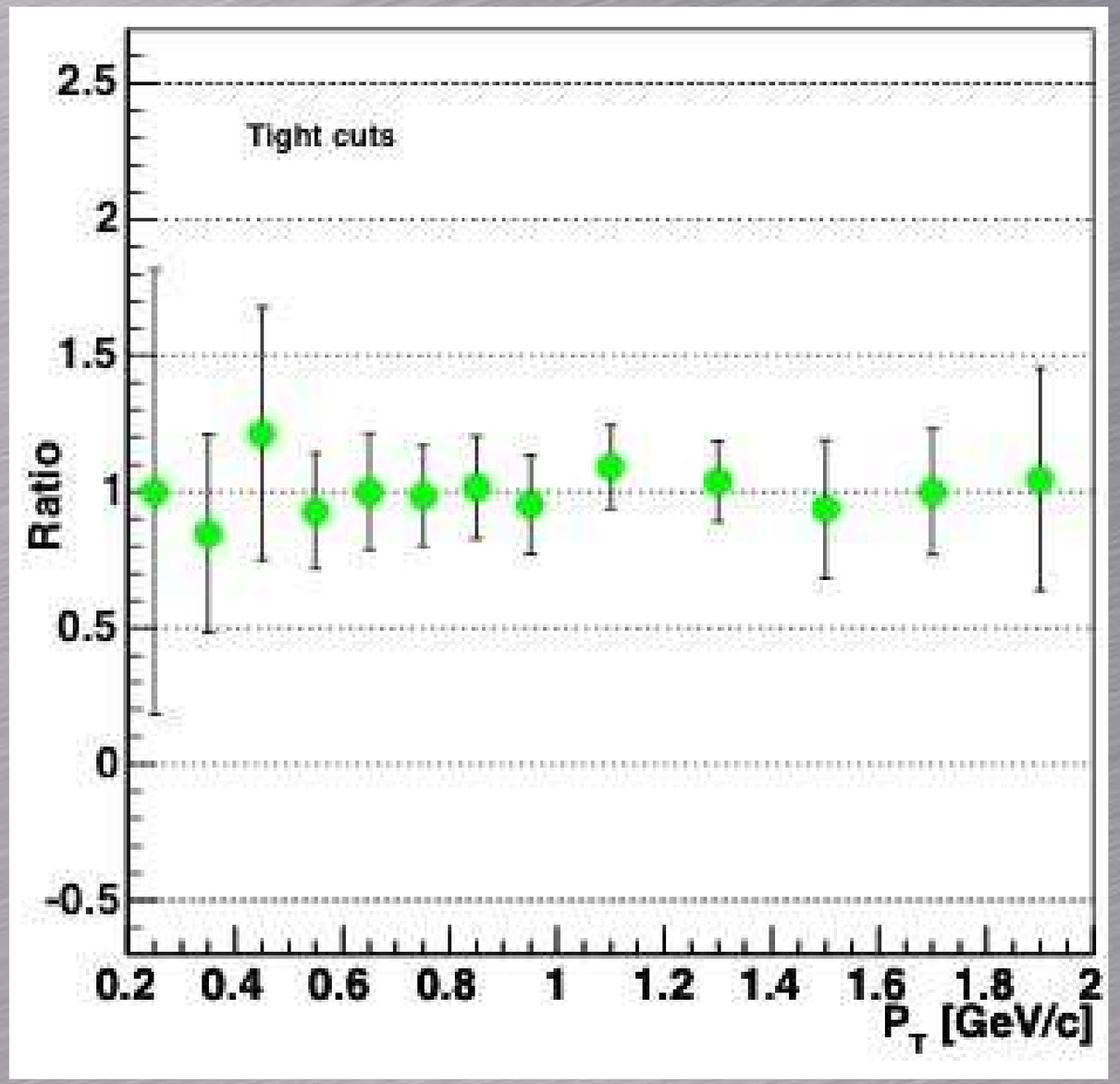
dAu Issues (2003)

- SpaceCharge effect observed in dAu via physical-signed DCAs. Is it a problem?



dAu Issues (2003)

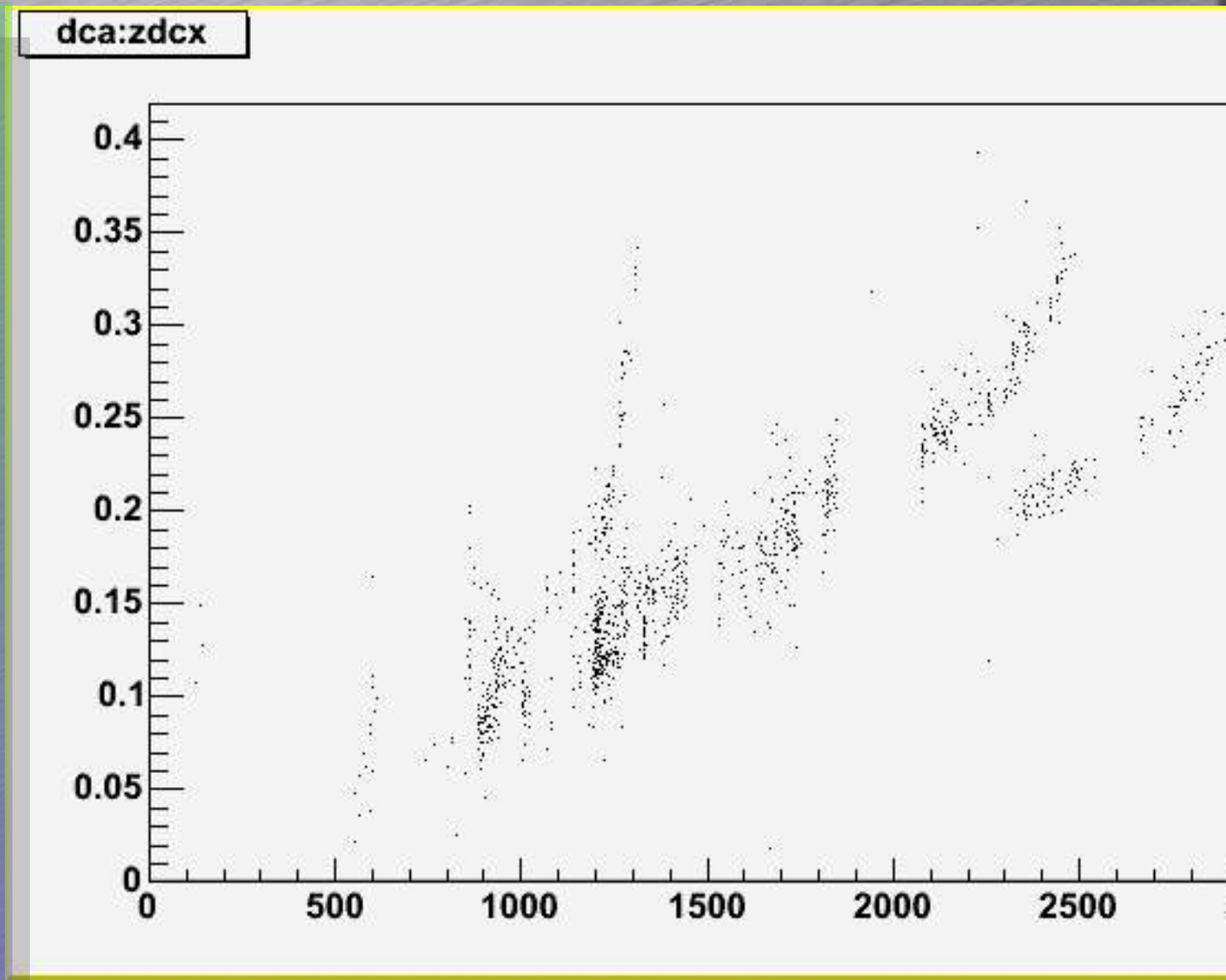
- Strangeness showed no conclusive evidence that correcting this data helps low-P_T issues for K^0_s.
- Contact me if you want to learn/study more.



Mark Heinz

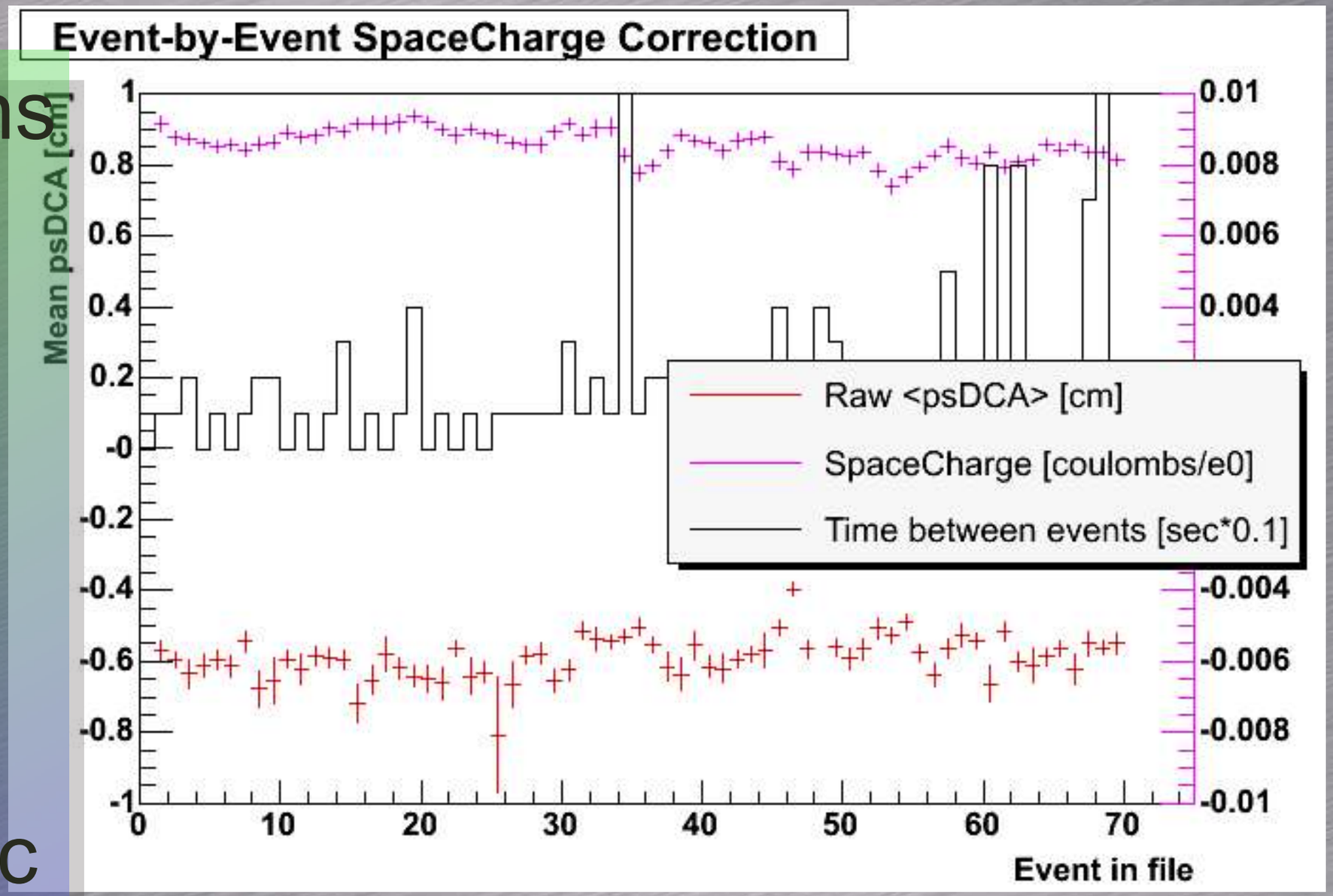
pp Issues (2004)

- Notable SpaceCharge!
- Correcting via scaler-based measures of luminosity.



SpaceCharge: E-by-E

- Fluctuations on the seconds time scale
- E-by-E handles this, but is problematic for ‘gaps’



Run 5044026: productionHigh

SpaceCharge: E-by-E

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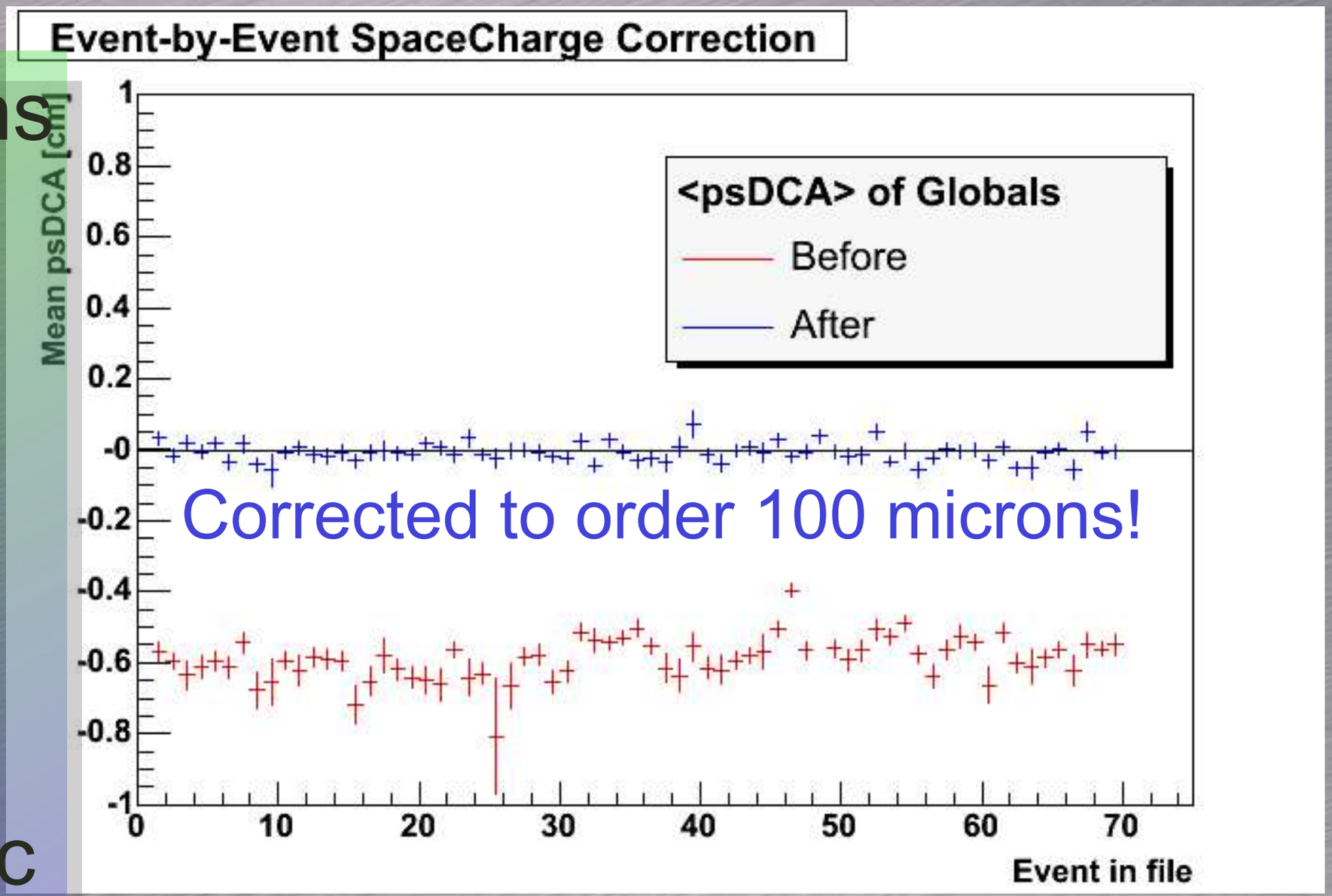
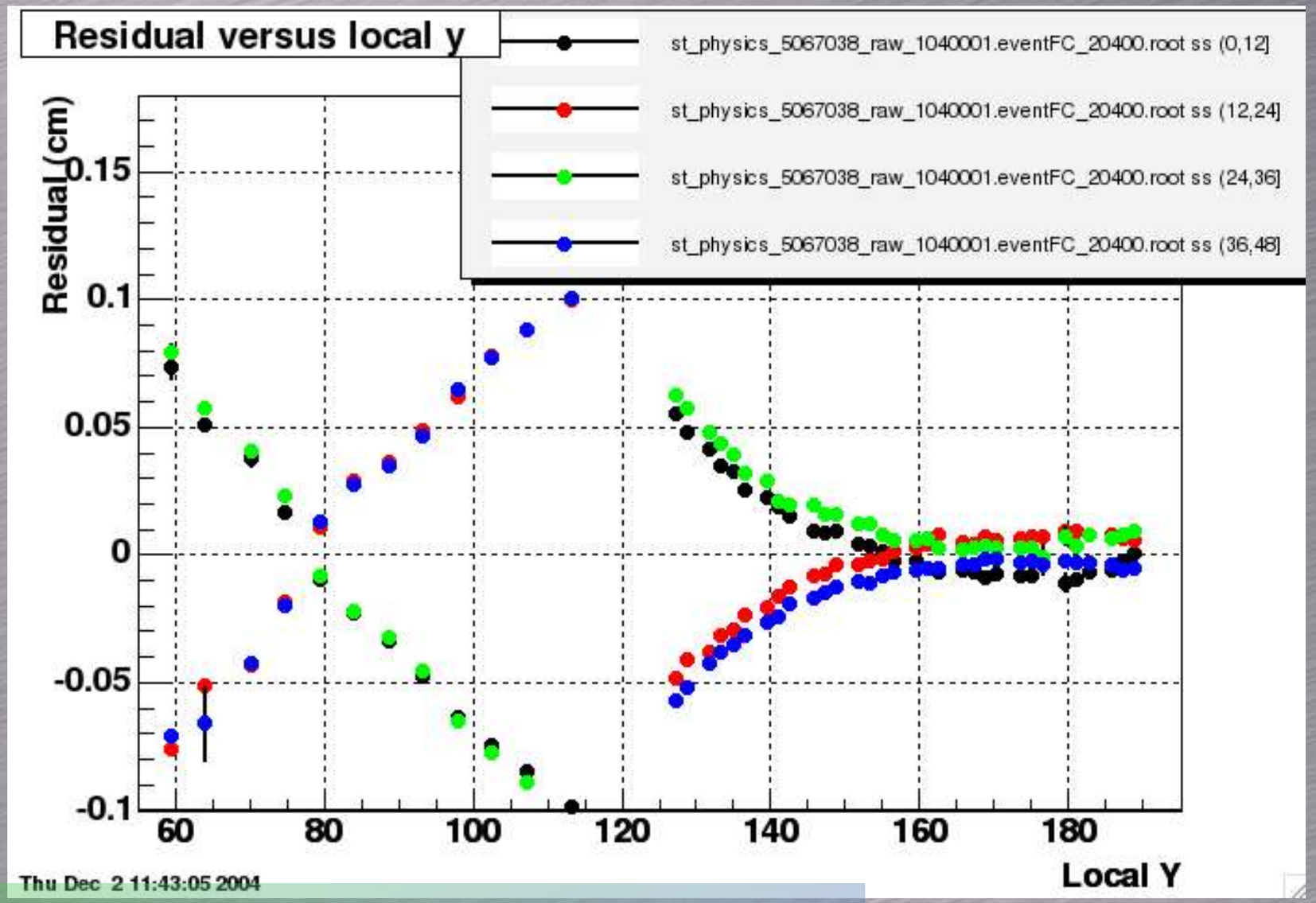


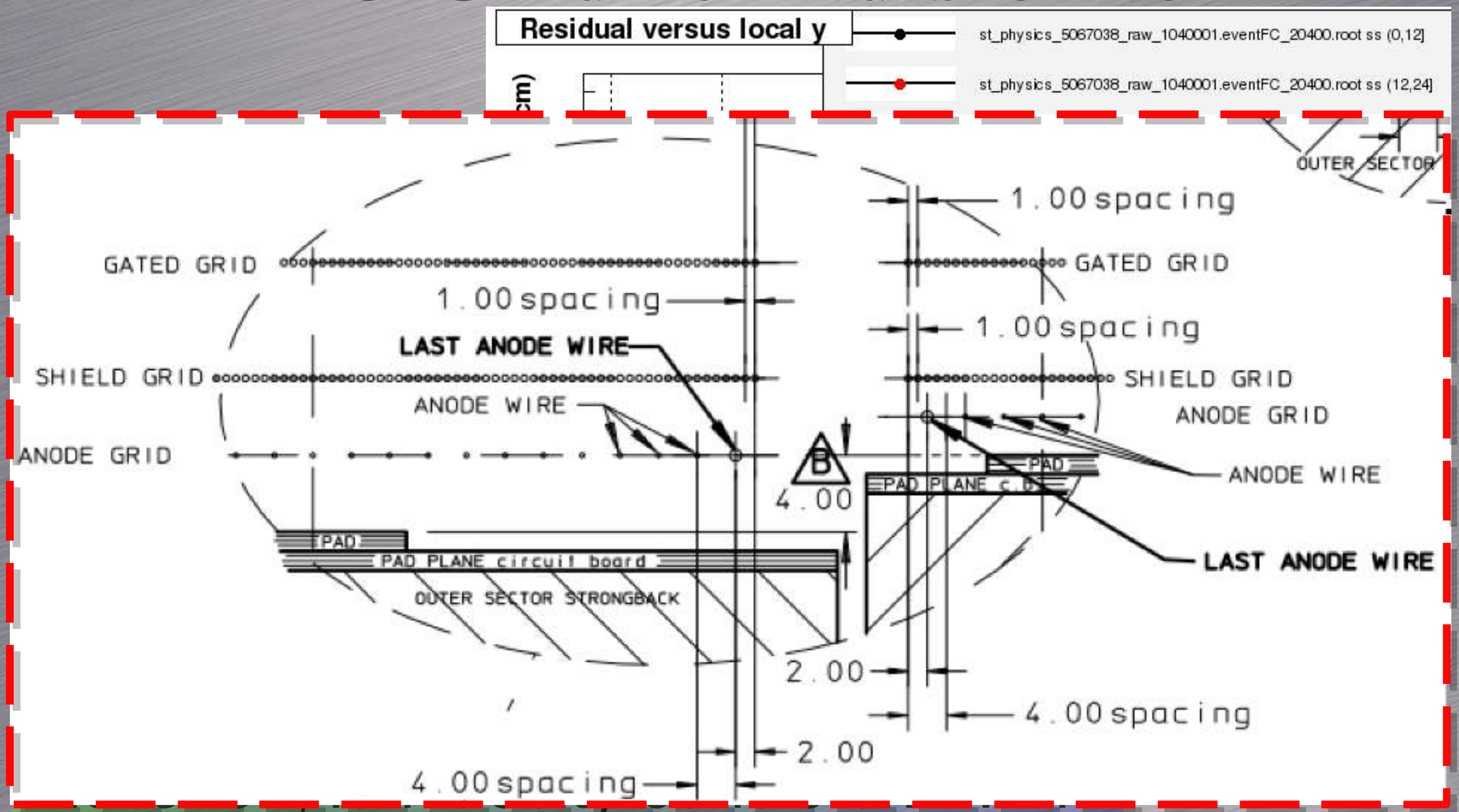
Run 5044026: productionHigh

TPC GridLeak distortion



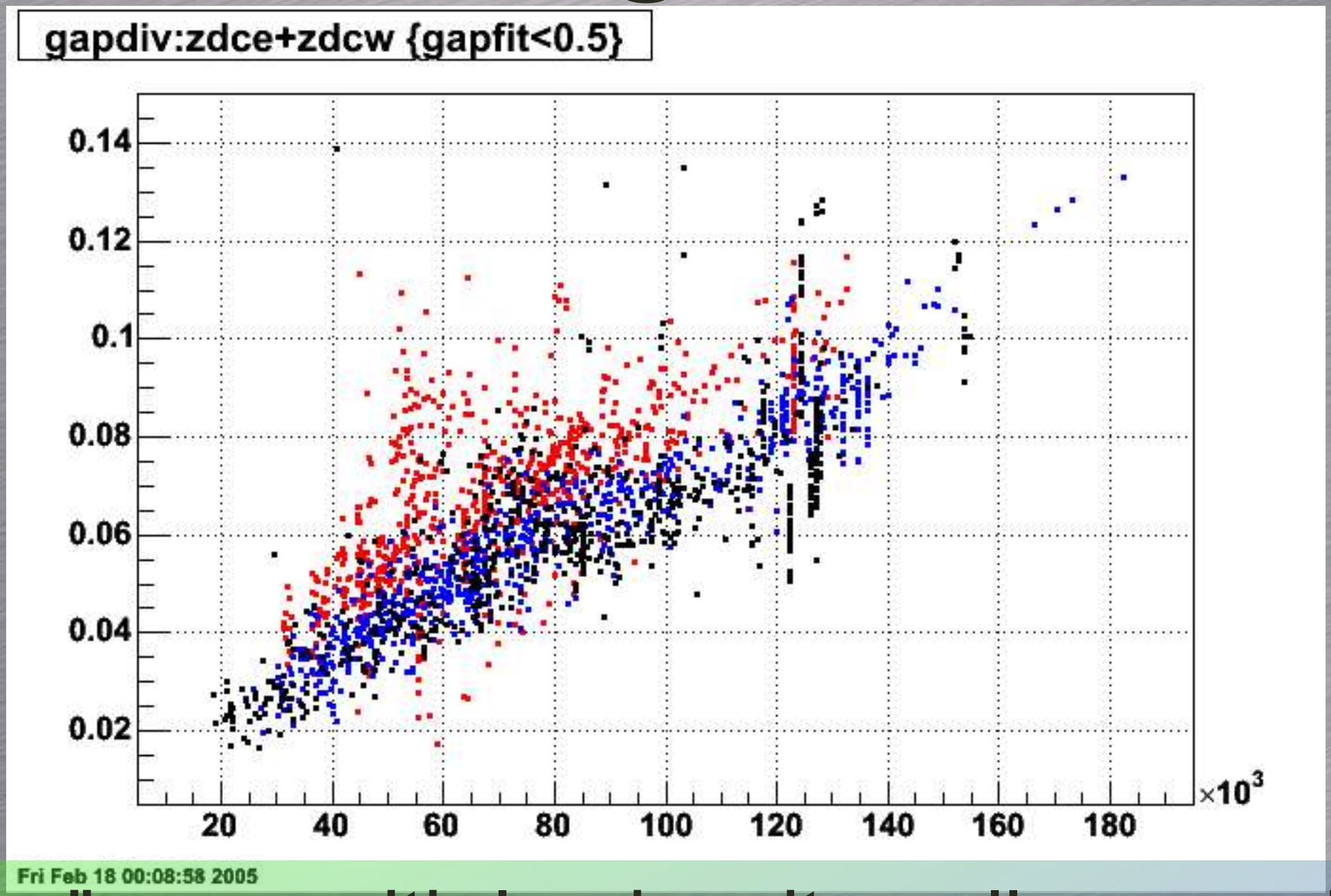
- Dependence on field, track charge, location, luminosity consistent with ion leakage at gated grid gap

TPC GridLeak distortion



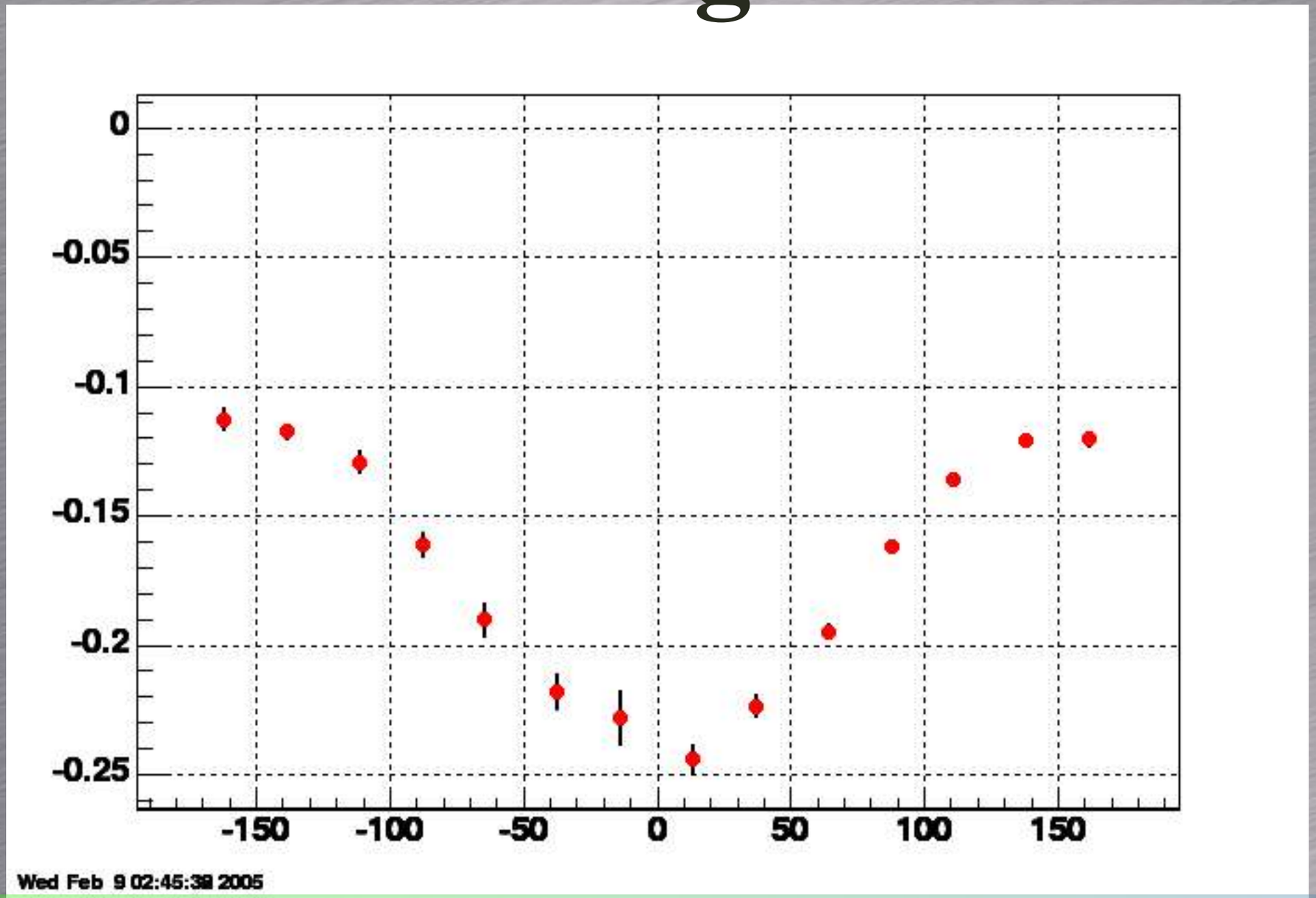
ion leakage at gated grid gap

Understanding the Distortion



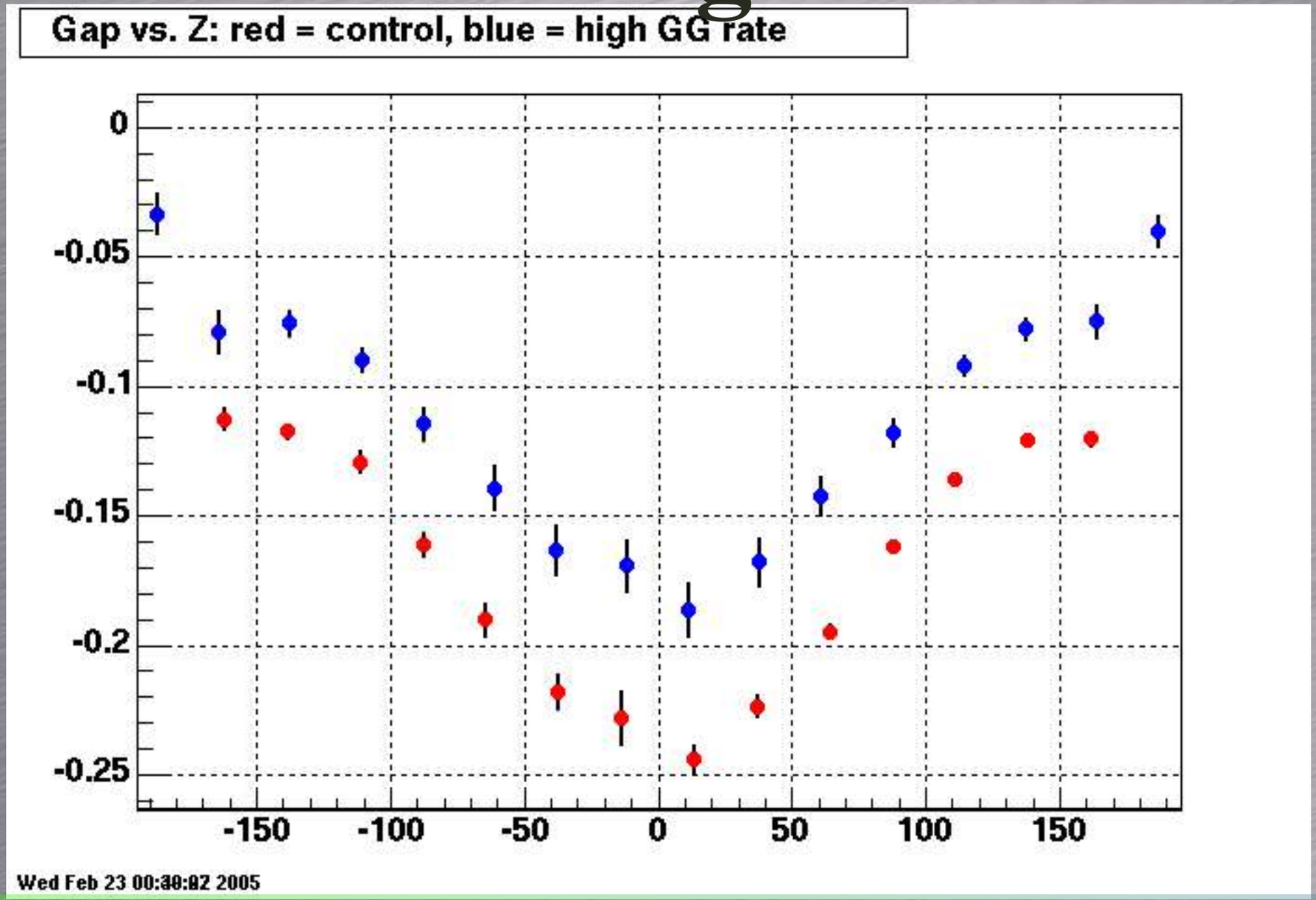
- "Gap" goes with luminosity - allows scaling with SpaceCharge (measure of lum.)
- Somewhat worse for half field

Understanding the Distortion



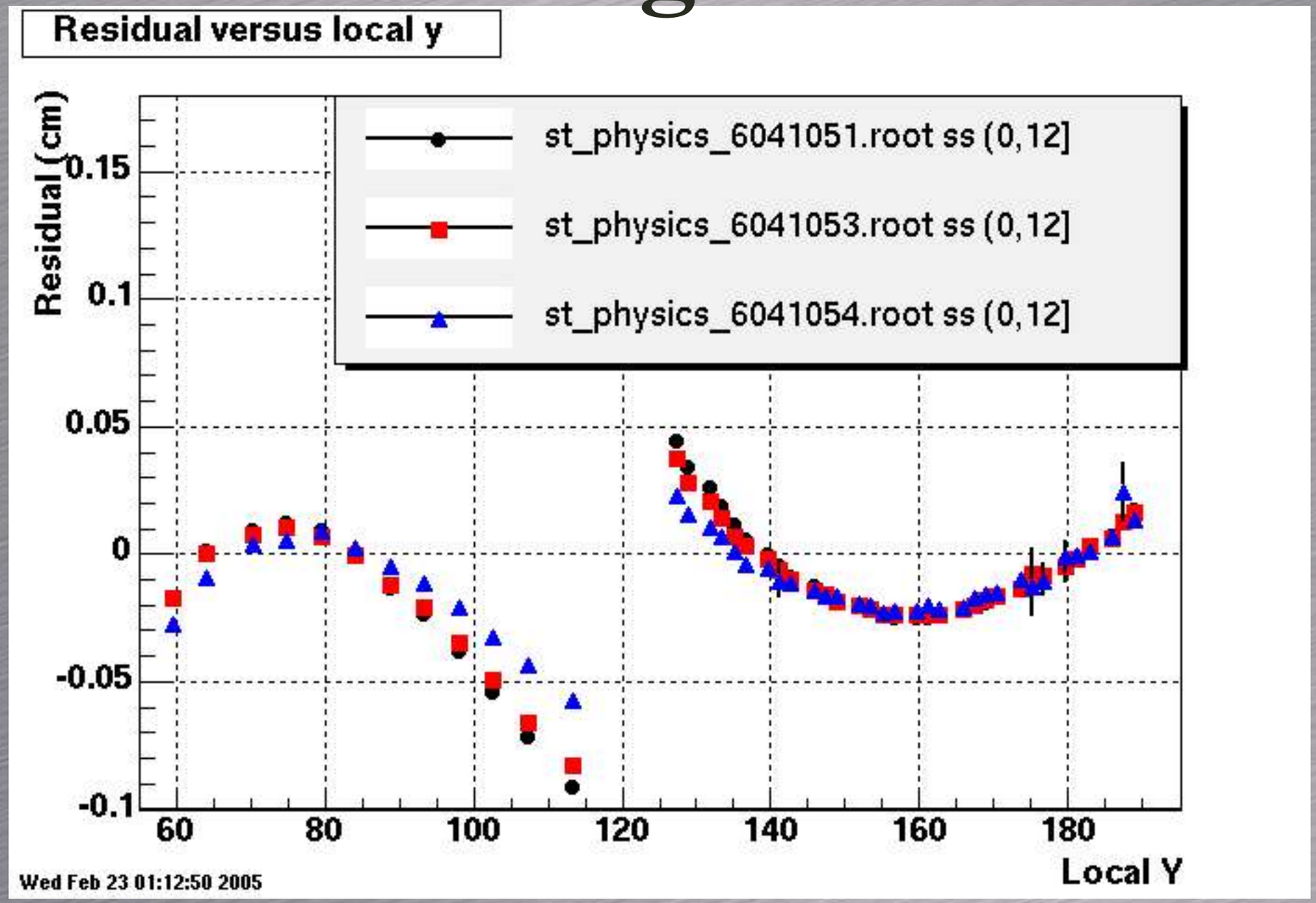
- "Gap" varies ~linearly with z

Understanding the Distortion



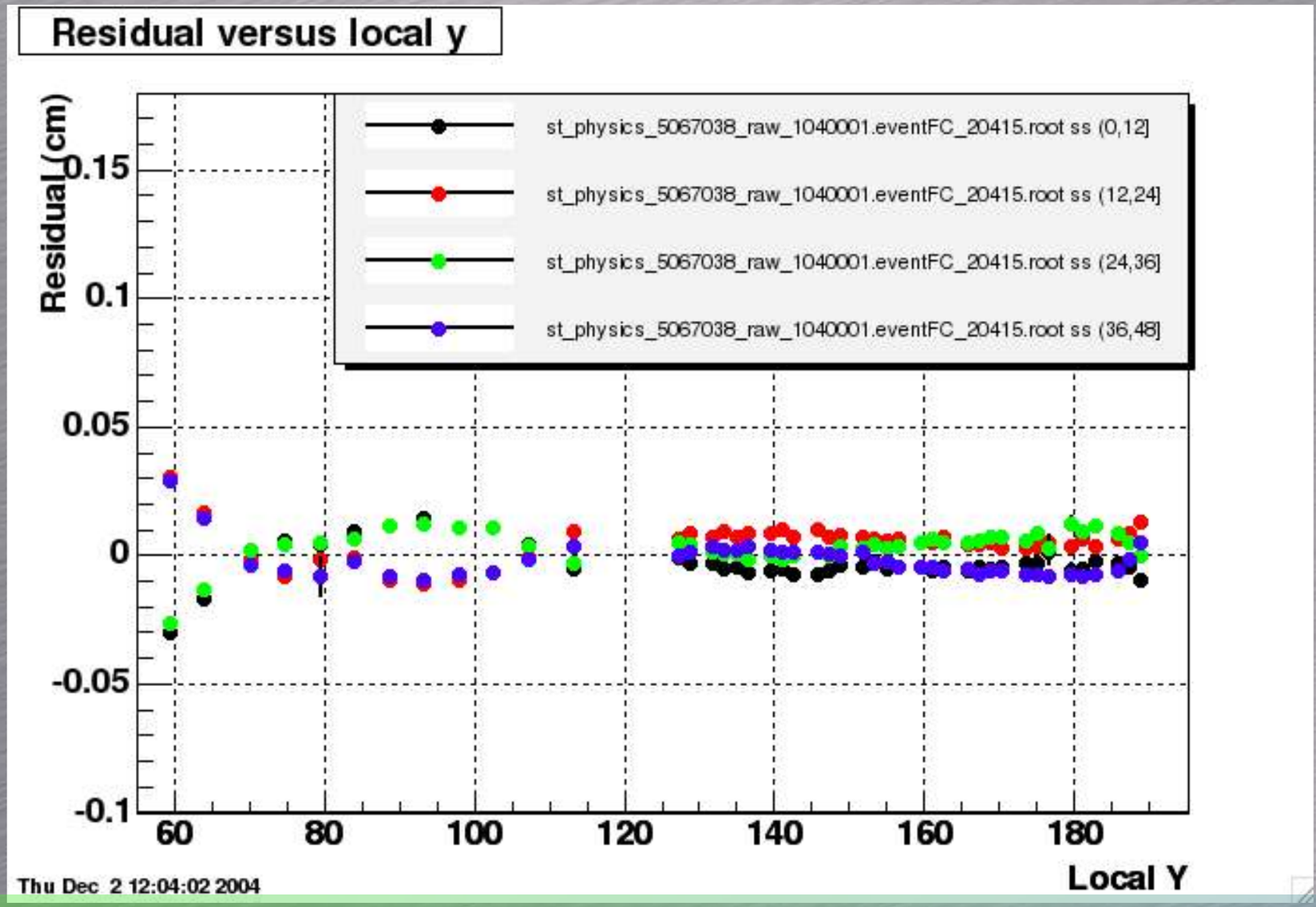
- "Gap" varies ~linearly with z
- No observed dependence on GG-opening rate!

Understanding the Distortion



- "Gap" goes (qualitatively, not quantitatively) with anode gains

TPC GridLeak distortion



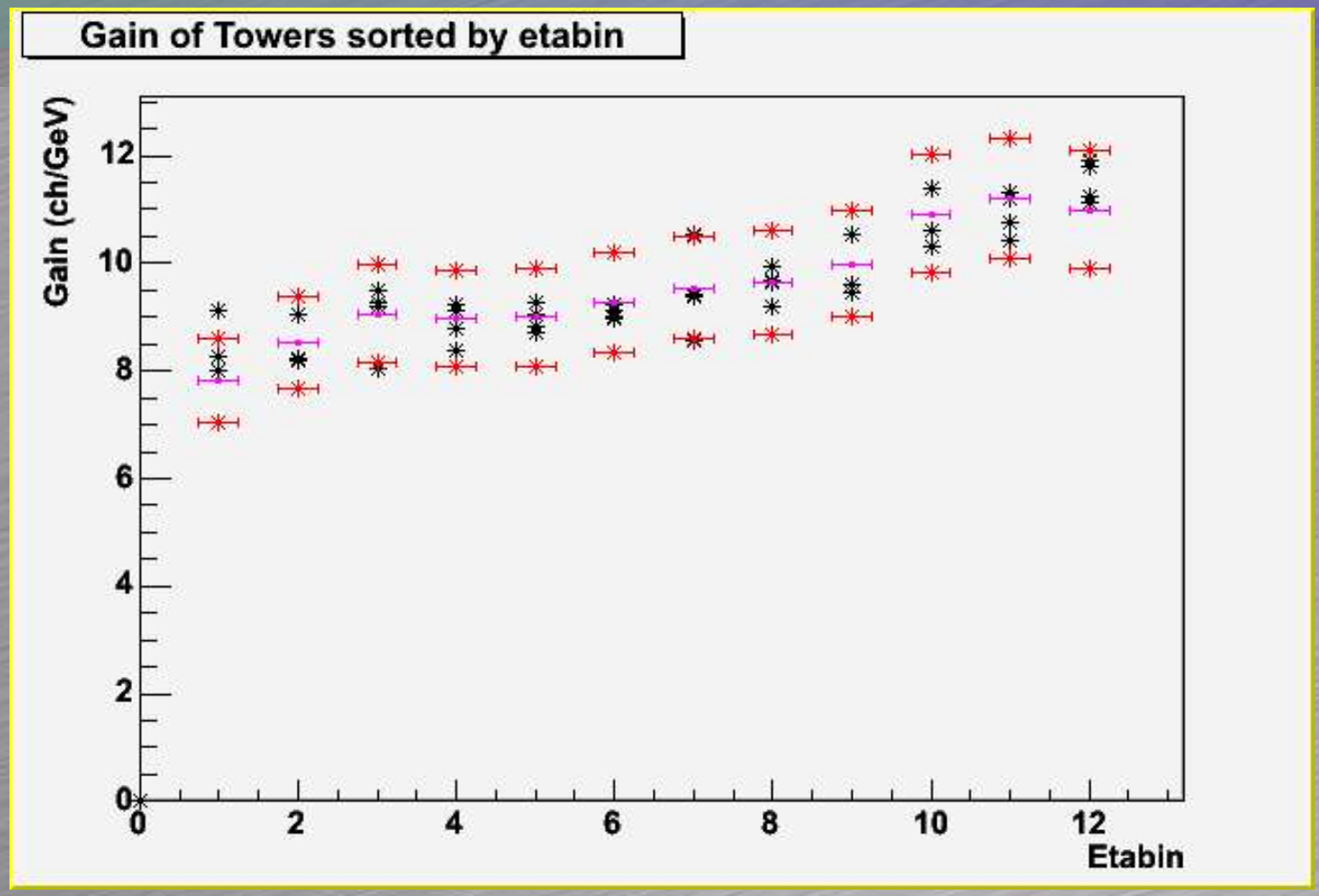
- Correcting for the gap leaves some residual even smaller effects (still under study - a testament to the TPC that we can see them!)

GridLeak Distortion Correction

- Is the GL correction even worth doing?
  - In January, several PWGs started reporting issues with the (at the time) current production.
  - Ran a test production using data under different fields and luminosities.
  - PWGs indicated that most issues were improved.
  - There appear to be some remaining issues (K^0_s mass in half field data).
  - Re-calibrated dE/dx and going again.

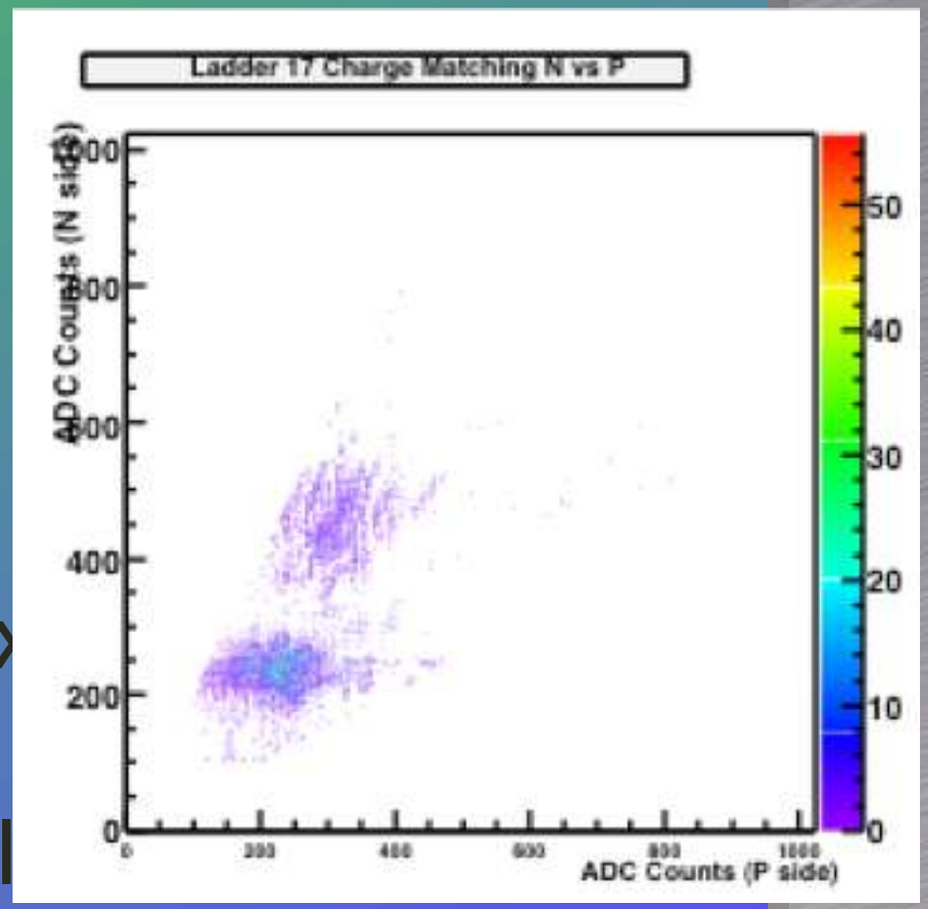
2005 Non-tracking detectors

- **BEMC** focus is on 2003 & 2004 data calib.
- **EEMC** gains done.
- **TOF** doing their own thing this year.



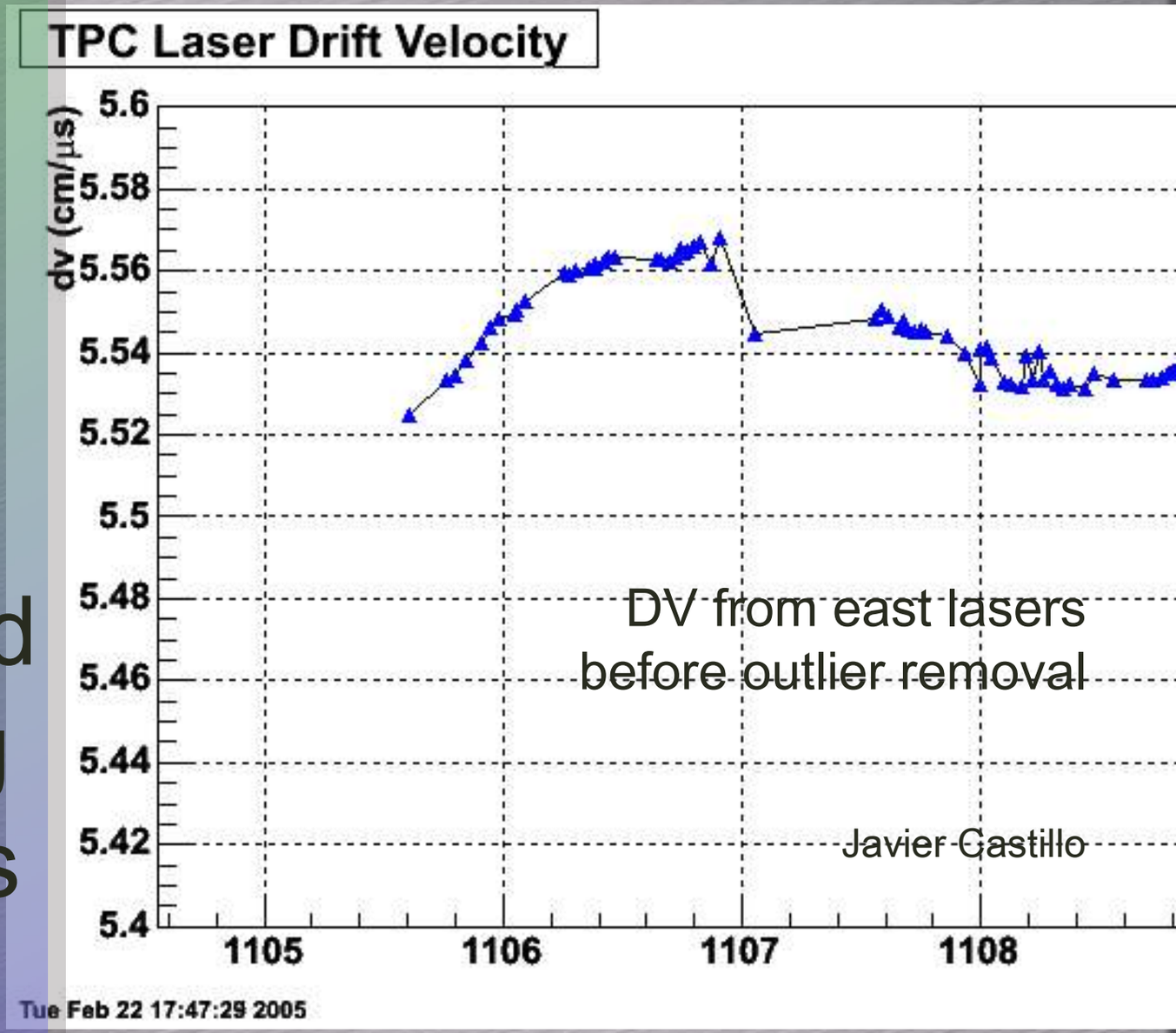
2005 Tracking Detectors

- **SVT**
  - Calibration that don't need tracking done.
  - Alignment needs to be redone (cone was removed during the break) - awaits fully-calibrated TPC
- **SSD**
  - Developing methods for gain calibrations and alignment (much to be done)
- **FTPC**
  - Calibs that don't need TPC vertex done (Gains, T0, d.v.)
  - Alignment/rotation needs fully-cal

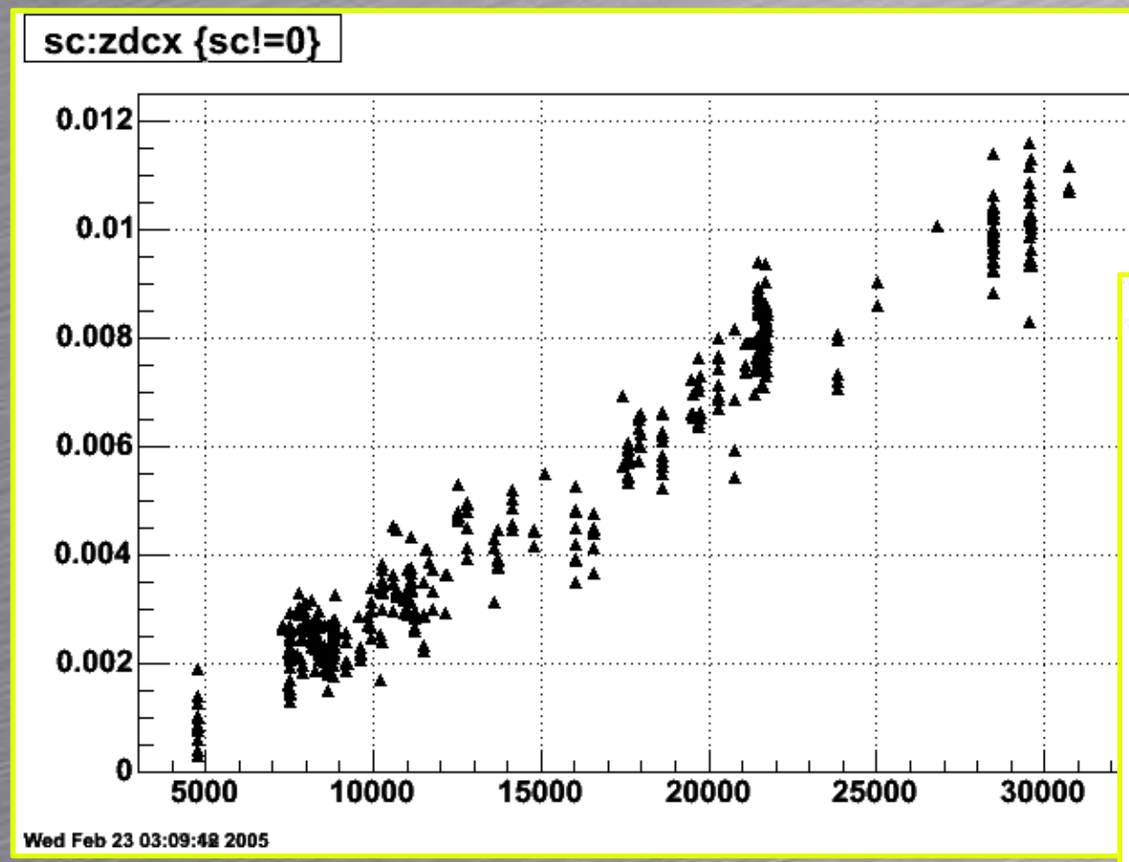


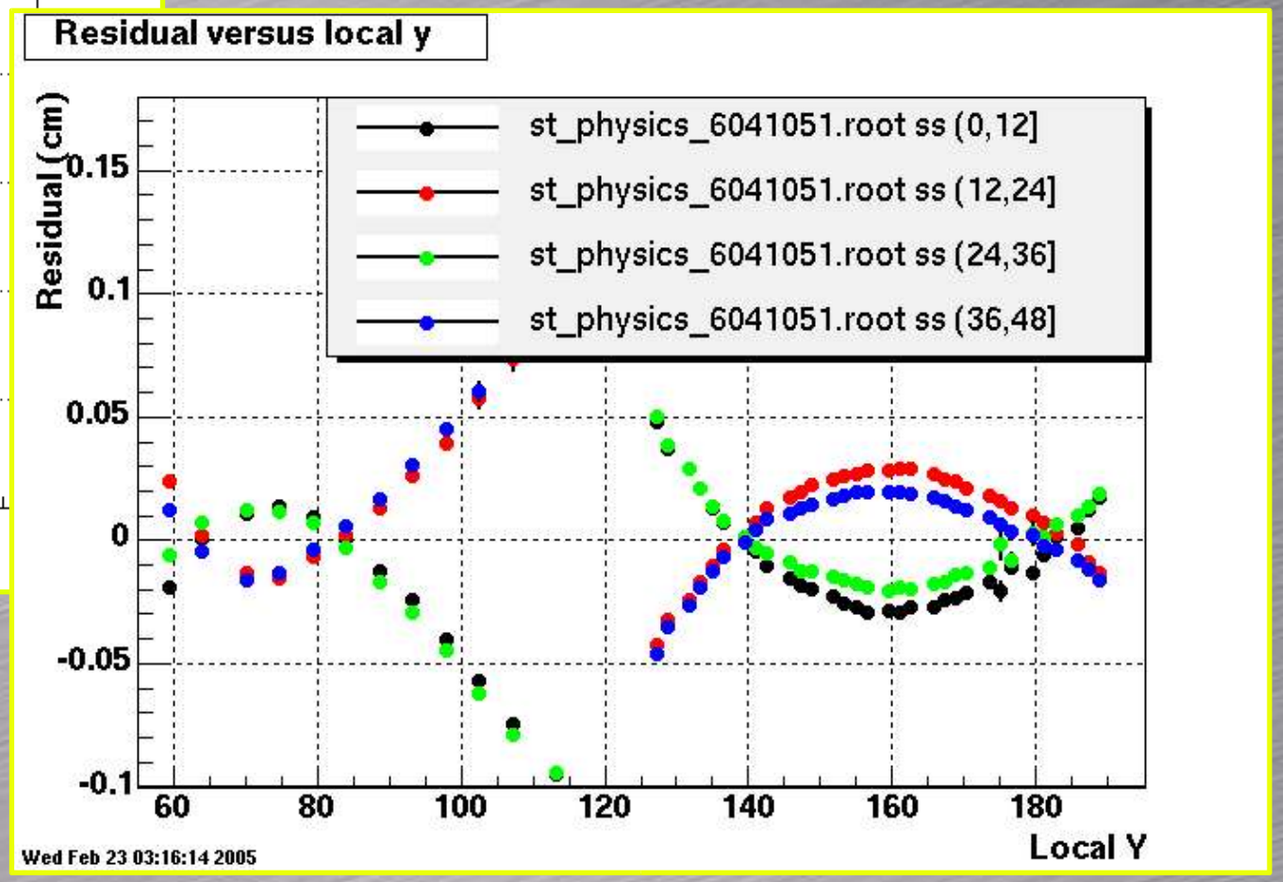
2005 TPC drift velocity

- Initially done using lasers, a process now automated, including insertion into DB (Javier & Jerome)
- Gets double-checked with vertex-matching from two TPC halves
- Still eventually want to use SVT (best)



2005 SpaceCharge + GridLeak





- SpaceCharge & GridLeak distortions comparable to what we had in AuAu

2005 TPC calibrations

- Second TPC short for 1.5 weeks
- Twist distortion calibration
- SpaceCharge vs. Scalers
  - Now have Scalers with higher sampling rates stored in the data stream.
- GridLeak vs. SpaceCharge
- dE/dx calibration
- Provide good tracking for SVT, good vertex for FTPC

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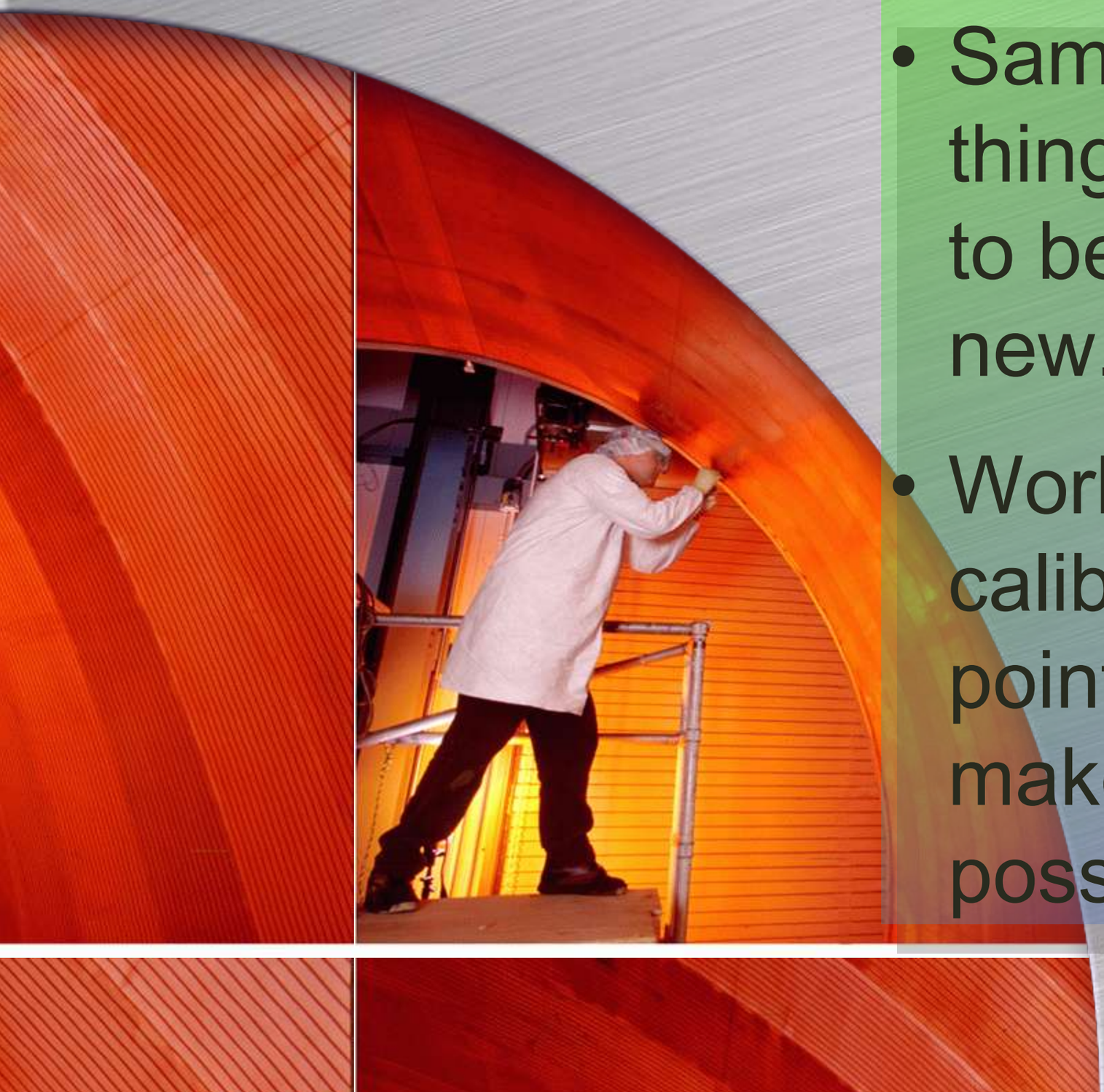
Wanted to understand 2004 AuAu first!

Future TPC

- Higher-than-design luminosities brought issues we did not expect (and have yet to fully understand)
  - Can we be surprised again at higher luminosities?
    - Lesson: **fine details can become coarse!**
  - Are there issues in the current data of which we're unaware? no measures?
- Beating design spec despite!
- Guarantee that a TPC replacement won't harbor surprises?

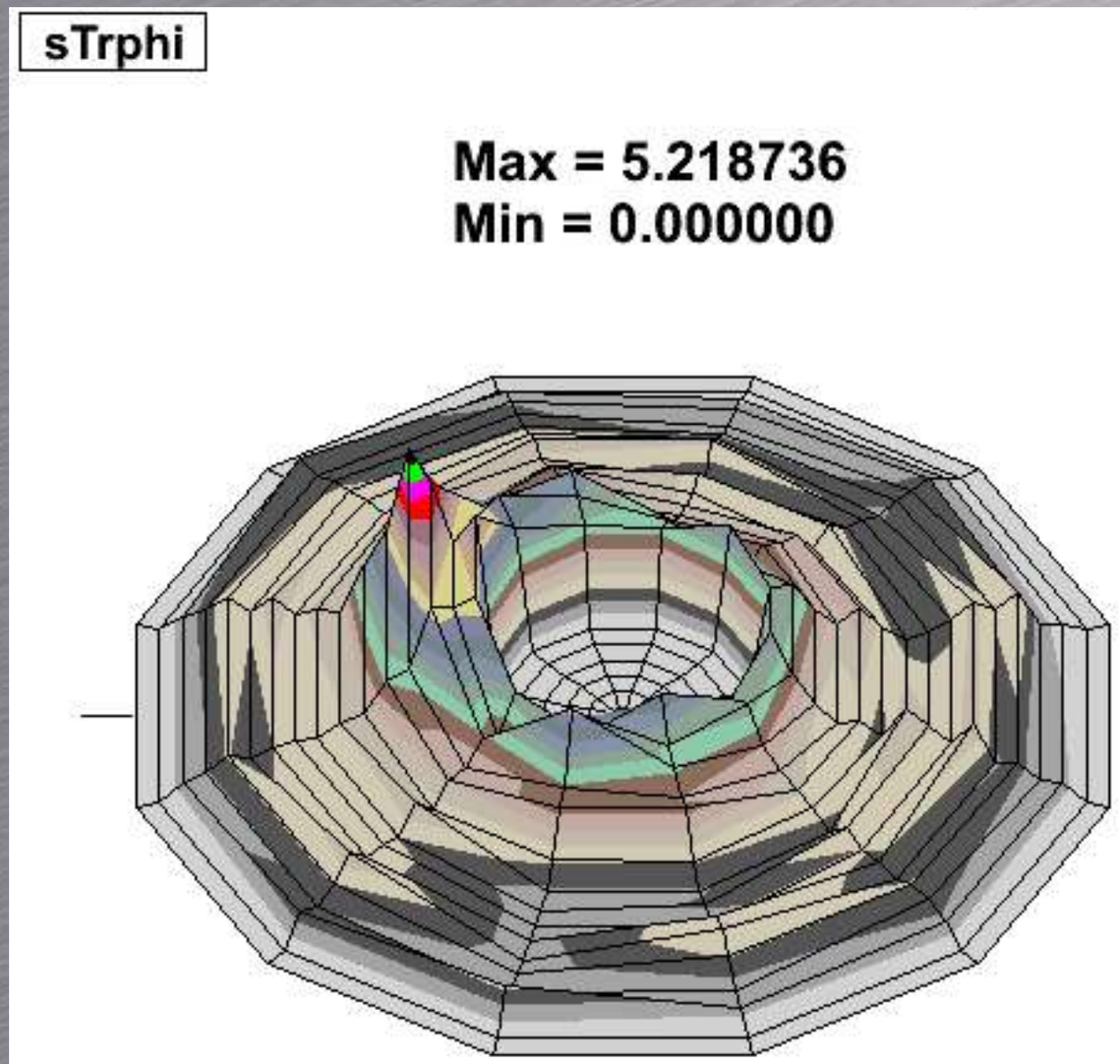
Summary

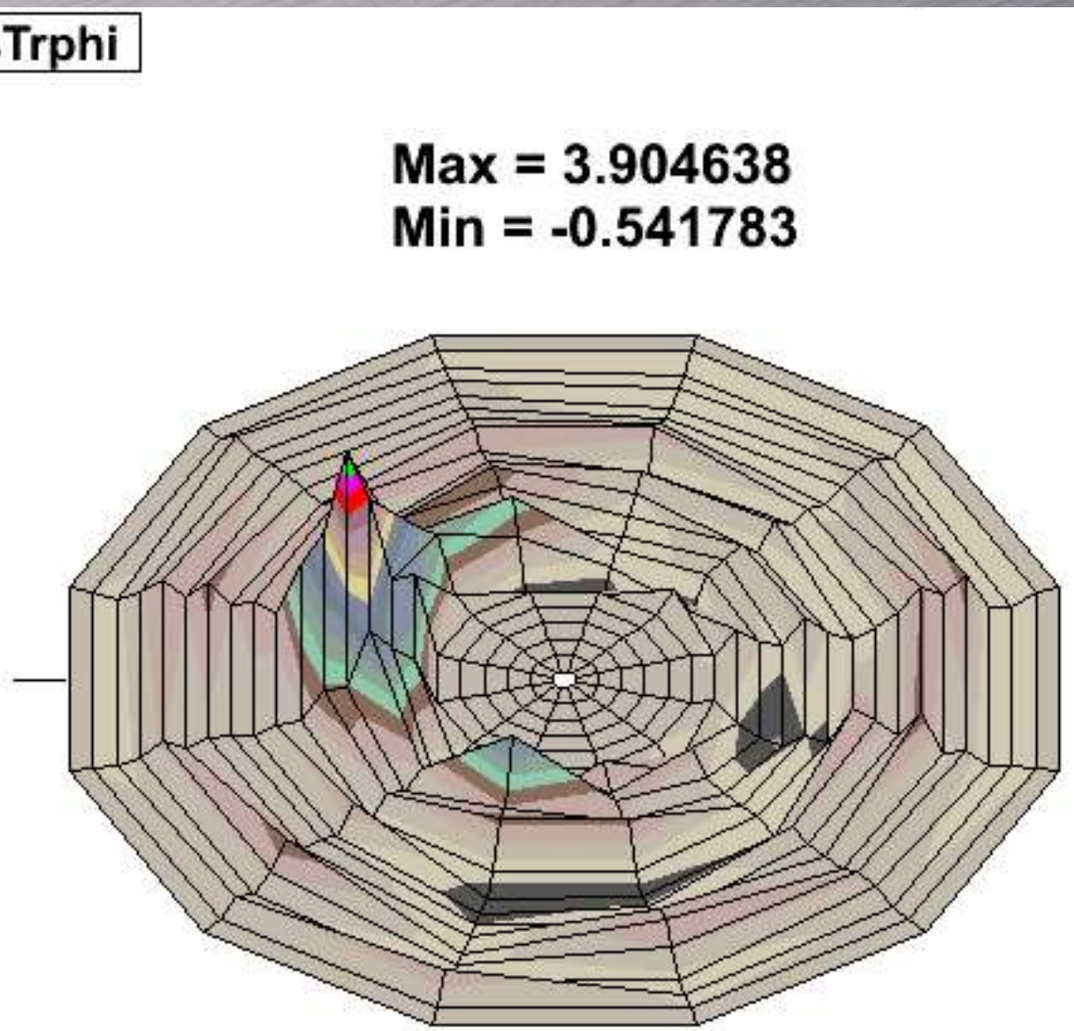


- Same old thing:always seems to be something new...
- Working to get calibrations to the point where they make great physics possible!

Extras

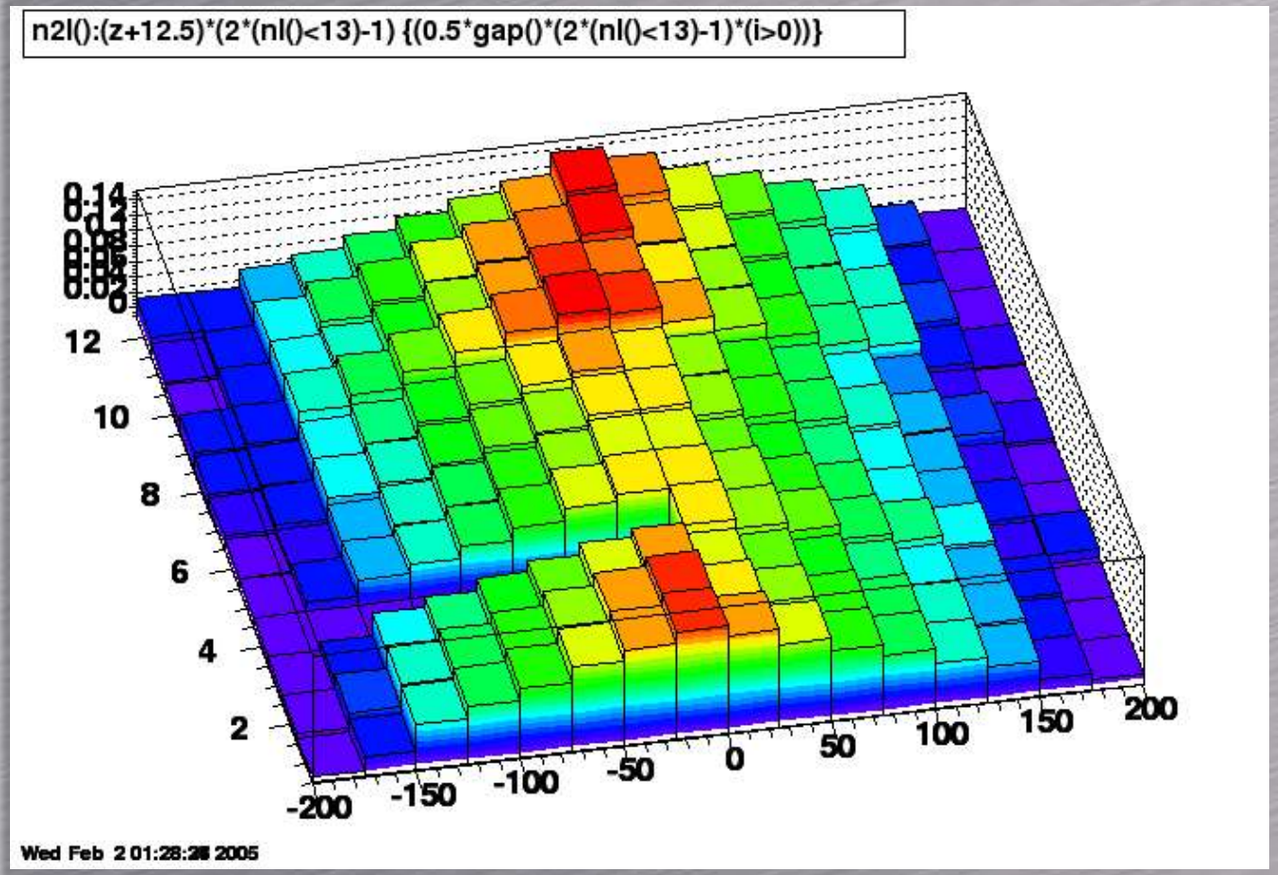
SpaceCharge : Zerobias

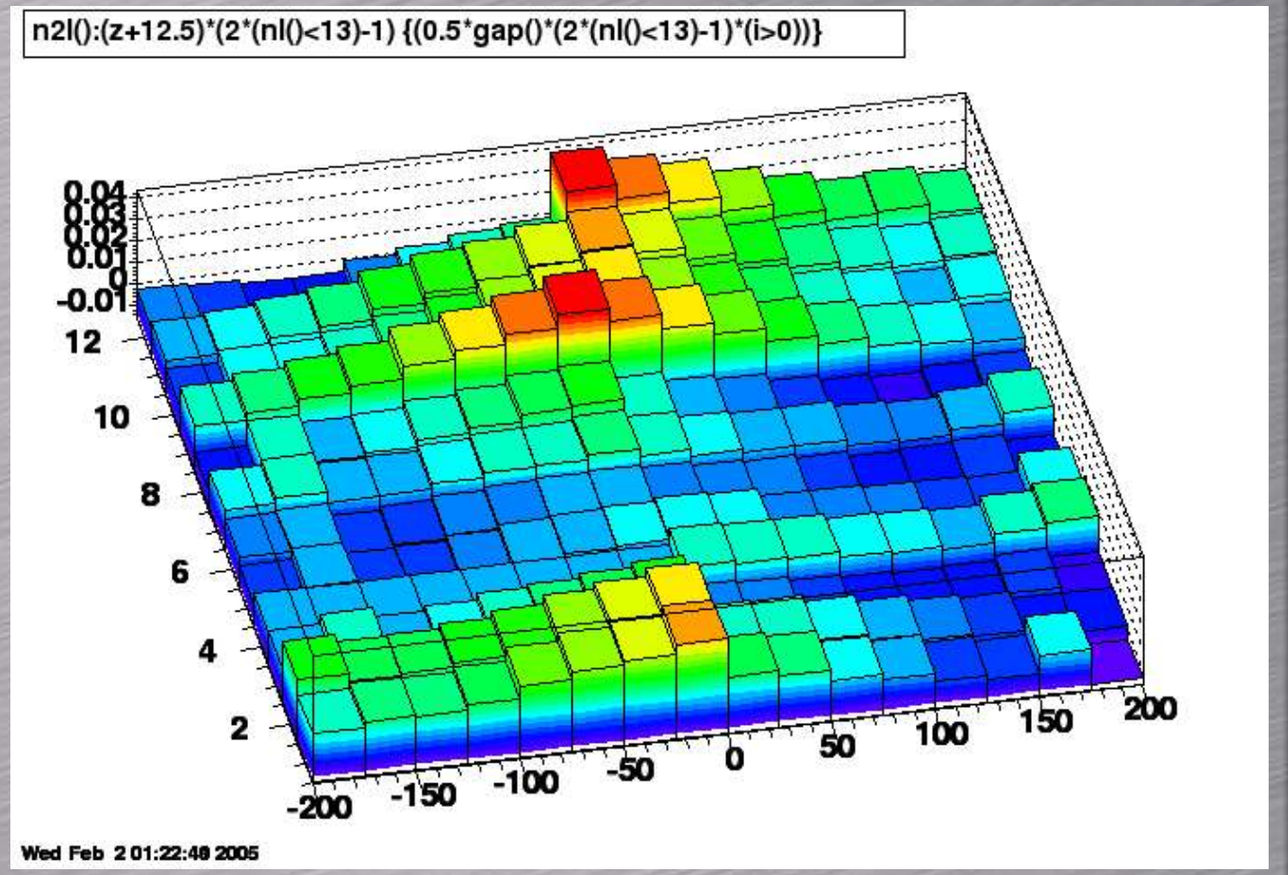




Run 5047041, Fill 4547

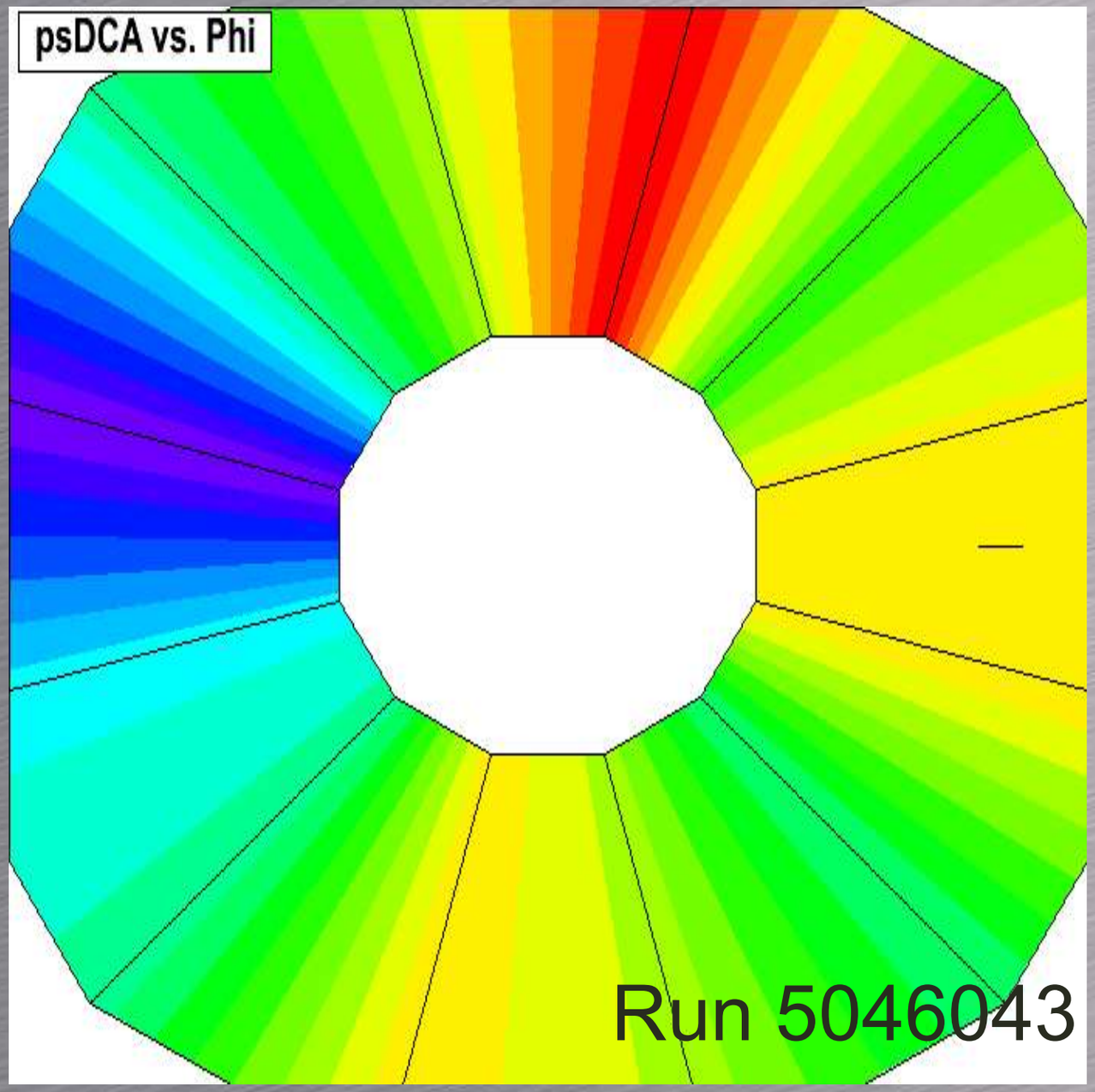
GridLeak Gap

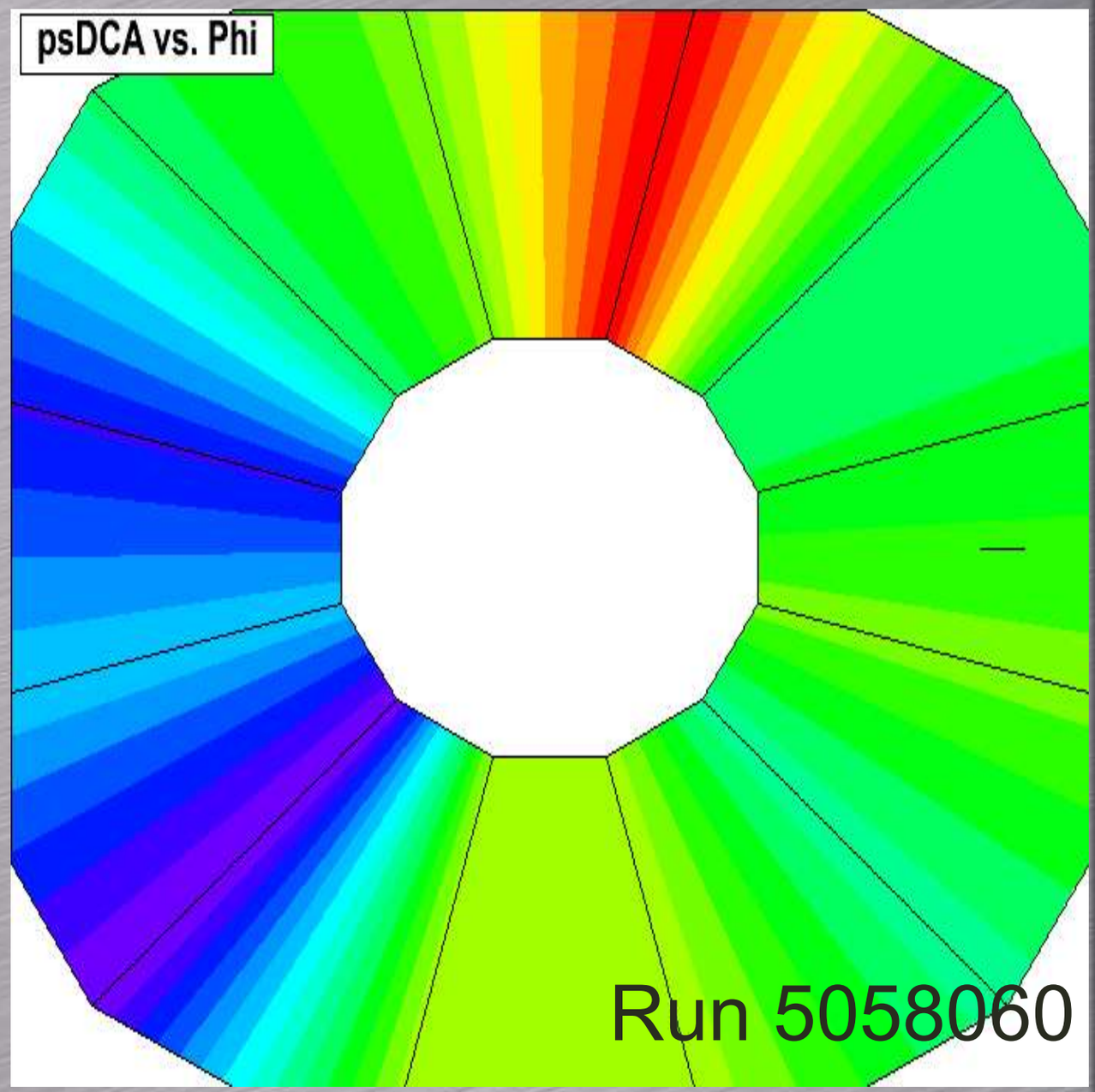




- There is some remaining azimuthal dependence

psDCA vs. phi





- Something going on versus phi