# Software Update

Assorted things that happened since Daegu

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Calice Collaboration Meeting, Lyon

September 17, 2009

- Automatic correction for temperature drift of calibration constants implemented and released

- New storage structure for calibration constants in place, eliminates enormous number of DB folders required

- Re-mapping of the slow control data (mix-up of CAEN address, module ID, and layer number) implemented and released - needs an additional processor

- all changes are propagated to scripts of `calice_run` package

- data treatment well tested, simulation runs but needs thorough testing

- MOKKA: implement measured thickness of absorber plates

Tracking

- Critical element for alignment and un-biased studies

- Worked over hit finding, TBTrackMapper essentially re-written - Now requires additional conditions collection (TDC cable map)

- Developments ongoing for unique scattering matrix with parameterised momentum dependence (D. Jeans)

- Would require reliable momentum information in data stream

- Currently dependent on `RunInfoProcessor` output, which needs to be revised for various reasons

- Thorough test of MC would be good (e.g. varify initial beam profile is reproduced after digitisation and reconstruction)

- Work by Arne Draeger (summer student at DESY)

- Muon run, 20x20 trigger, from CERN 2007

- 'Hit' = difference of two TDC signals

- More than one signal per line: plot any combination

- Untreated data shows many unphysical signals (noise?)

- Expect constant sum => impose cut

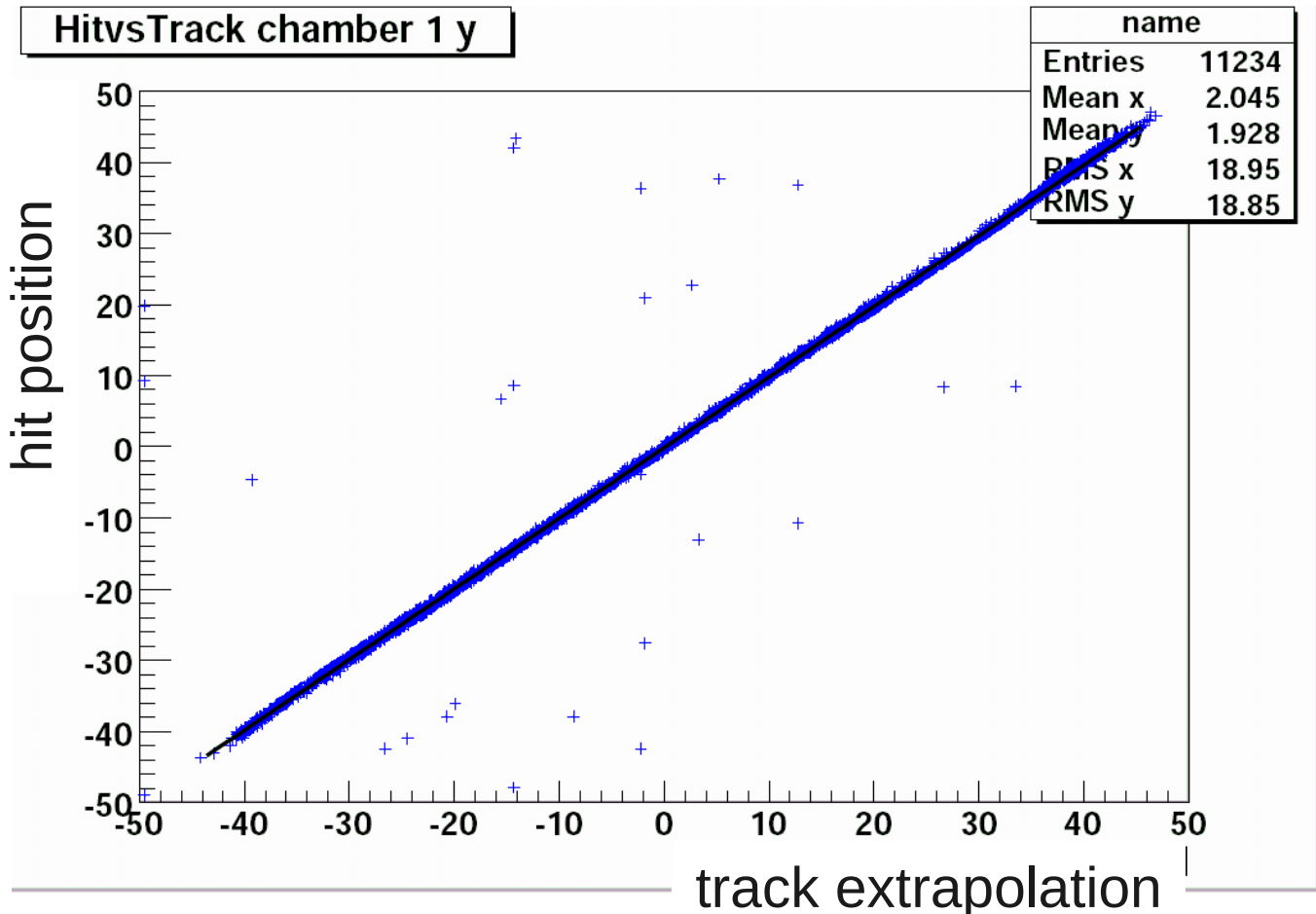- One value fits all DCs (for this run...)
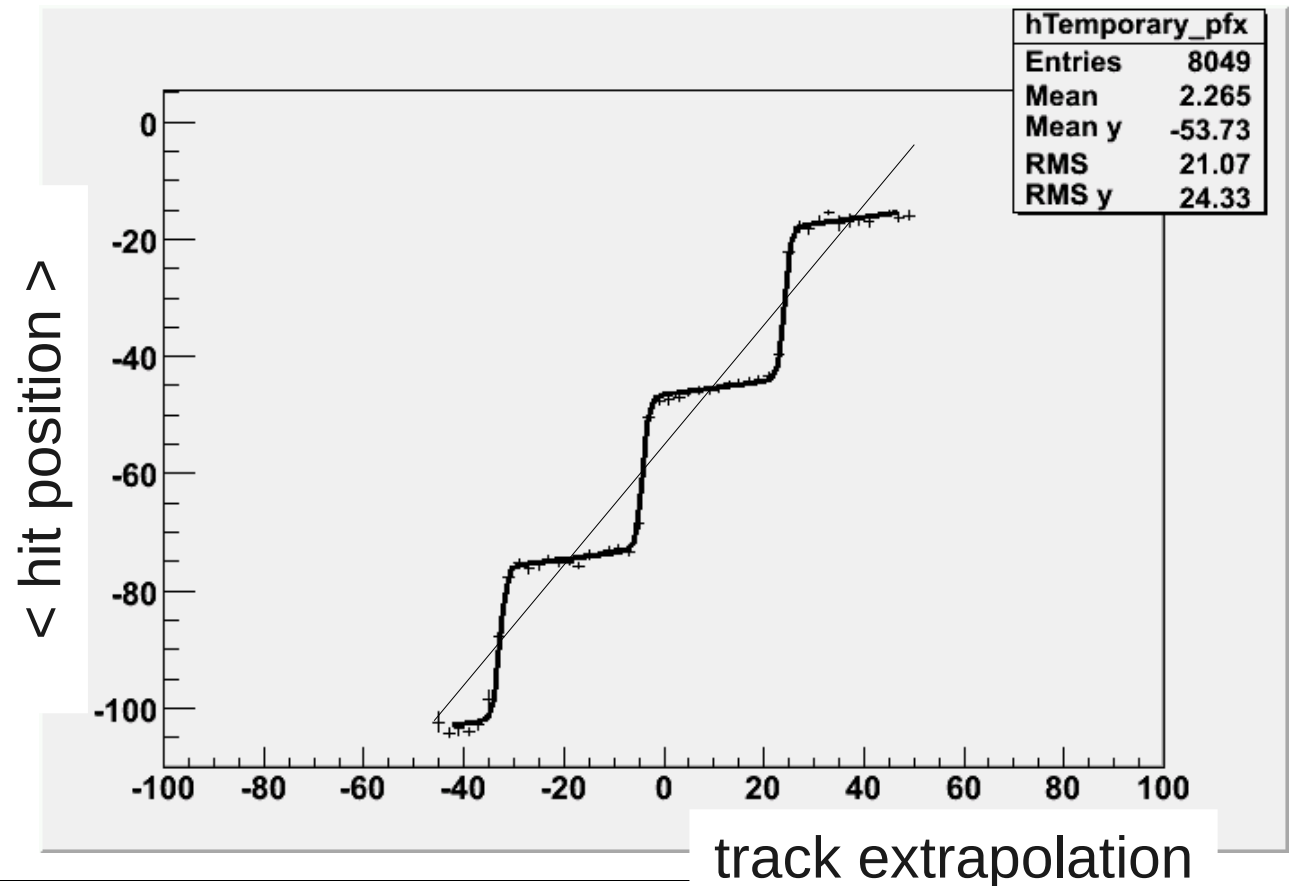
Sanity Study

- Work by Arne Draeger (summer student at DESY)

- Muon run, 20x20 trigger, from CERN 2007

- 'Hit' = difference of two TDC signals

- More than one signal per line: plot any combination

- Untreated data shows many unphysical signals (noise?)

- Expect constant sum => impose cut

- One value fits all DCs (for this run...)

e2:-e1 {e2-e1<1300&&e2-e1>1200}

Internal Alignment
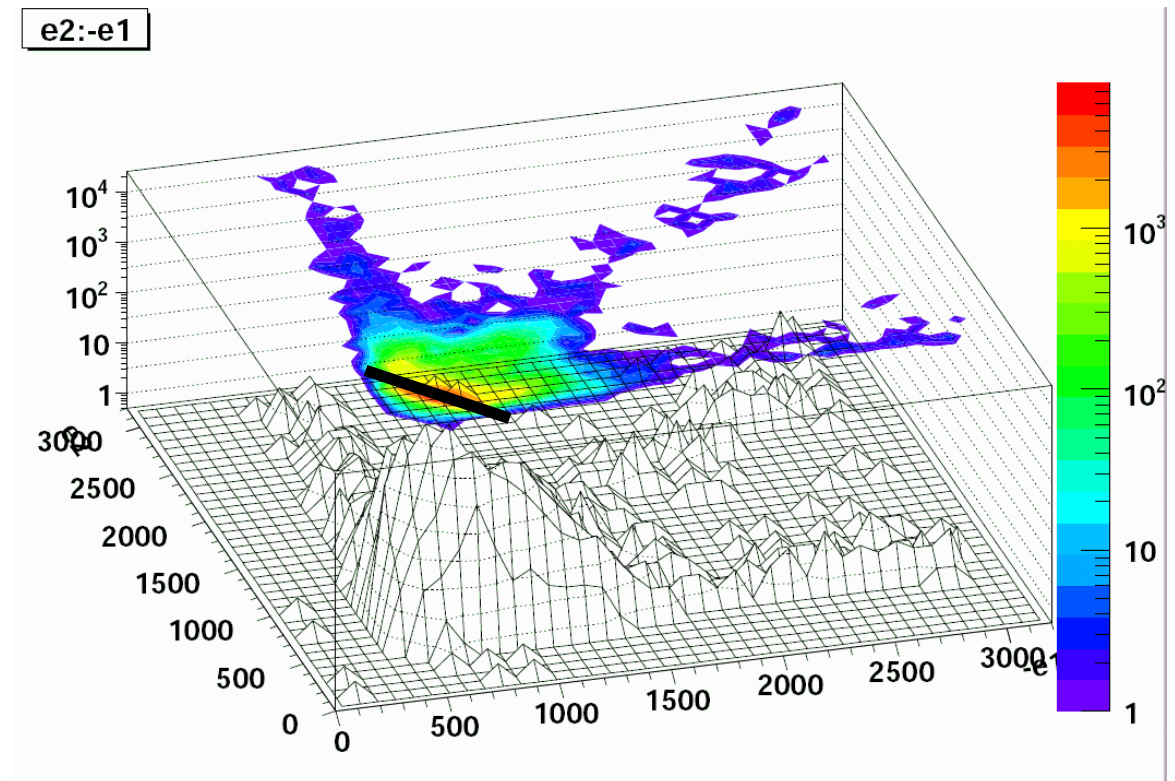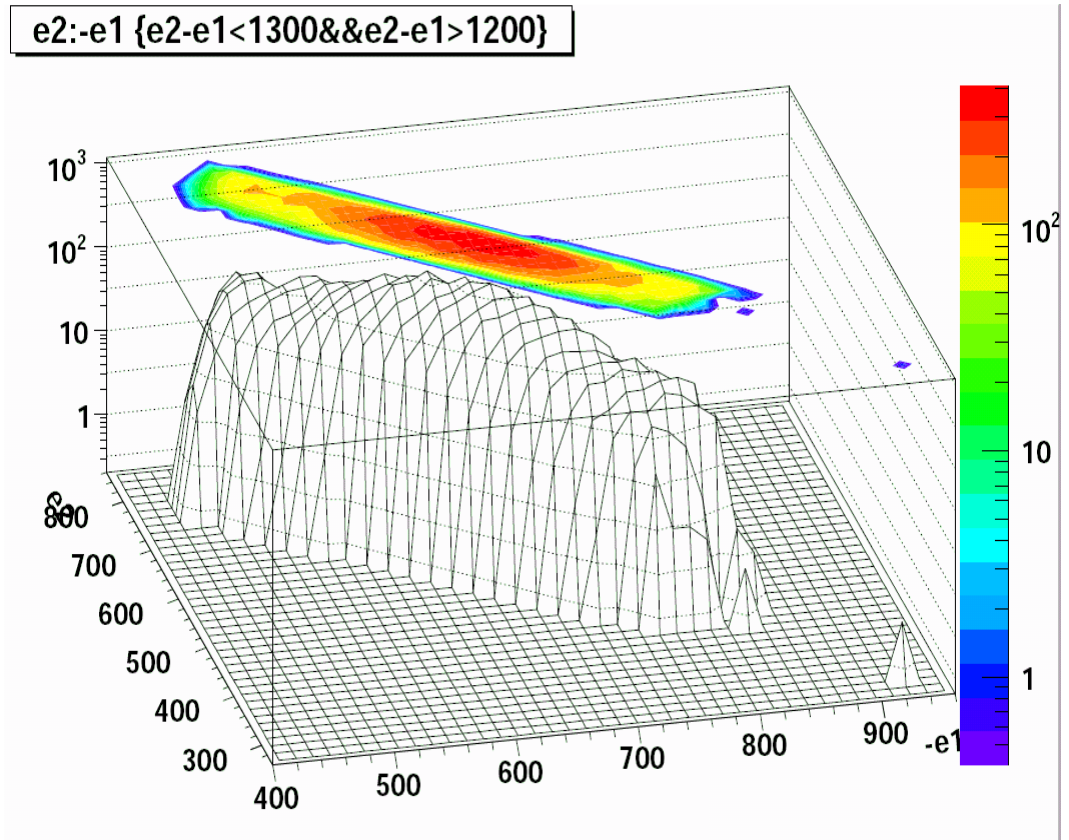
- Correlate track extrapolation with DC hits (slightly biased, but does not require modification of track fit)

- Beware - this is not a fully constrained alignment test

- "signals from straight trajectory are reconstruced as straight line"

- No constraint on scale, tilt, or divergence

name	
Entries	11234
Mean x	2.045
Mean y	1.928
RMS x	18.95
RMS y	18.85

HitvsTrack chamber 1 y

hit position

track extrapolation

External Alignment

- HCal has ~120cm from 1st to last layer with known granularity => can be used as external constraint using muon data

- HCal granularity induces step function

- Cell center / middle of plateau expected on 1:1

- Non-trivial fit, found many pit-falls from one run only

hTemporary_pfx	
Entries	8049
Mean	2.265
Mean y	-53.73
RMS	21.07
RMS y	24.33

< hit position >

track extrapolation

- Layer-dependent offset => shifted DCs
  (not observed)

- Similar for slope => correlated DC scales fake divergence
  (not observed)

- Average offset => HCal position
  (main aim, good numbers)

- Layer-wise diff from average offset => Layer misalignment
  (can be few mm in x, surprisingly large)

- Average slope => DC scale factor
  (close to unity, only few % off, barely significant)

- Layer-wise diff from average slope => not expected w/in errors
  (not observed)

Future Prototypes

- DAQ integration and online-offline interface for RPC DHCal discussions have started. Know principle path to follow, work on implementation details is ongoing

- Online-offline interface for technological prototypes in design phase, some general aspects have been decided already (offline is LCIO based, implementation language C++)

- Expert round from different DHCal groups met to discuss general prospects for common offline processing framework between event building / conversion to LCIO and analysis

- For the recent combined setup, 'hard' data, i.e. algorithms and code structures gets more and more complete (with exception of the SciEcal), at least for the CERN setup

- Focus has to shift to improving 'soft' data, i.e. conditions in DB; this is where >90% of the CERN/FNAL difference has to be handled

- Are 'expert' tools good enough for 'service' tasks?

- Some personal remarks on future emphases:

  - avoid parallel developments

  - design preceeds code, define common interfaces a.m.a.p.

  - geometry, geometry, geometry (data, simulation, analysis) is a huge task ahead - for CALICE and for the core SW