DC calibration & Tracking

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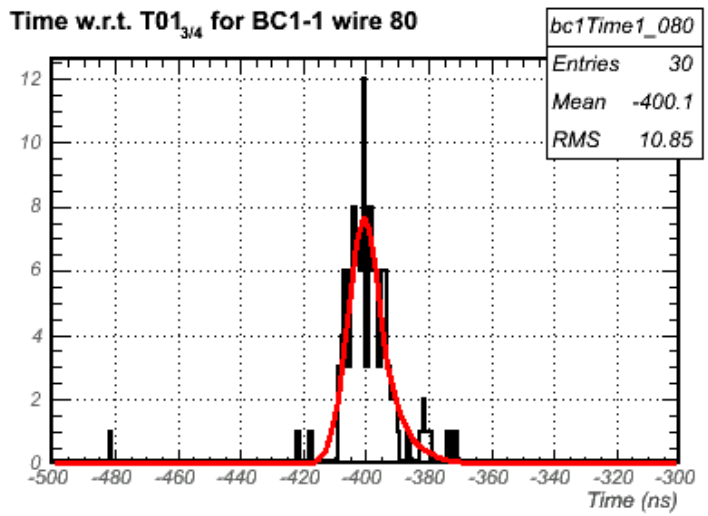
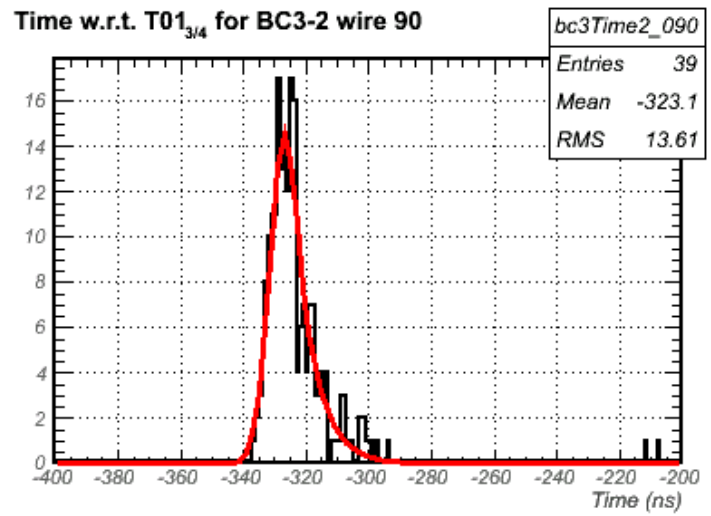
MIPP Collaboration Meeting

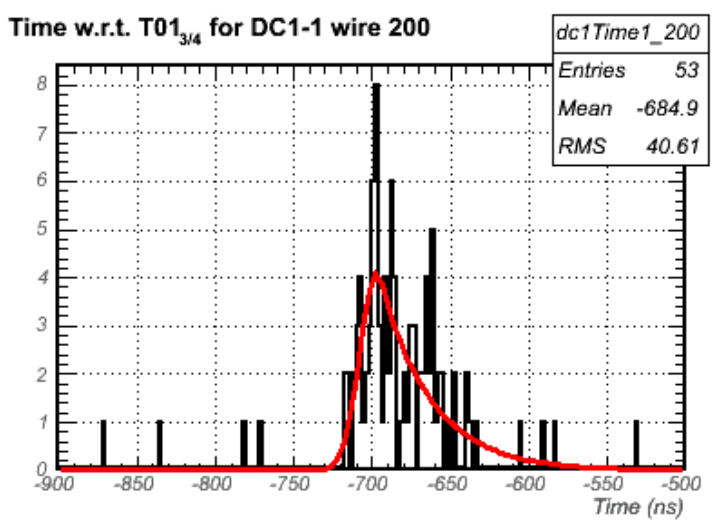
Approach

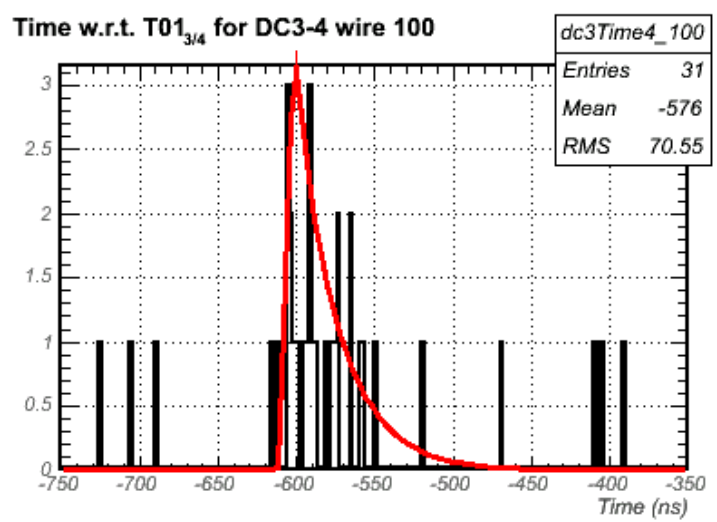
- Pick “nice” events
  - Limit multiplicity of T01,TBD, and each chamber
- Plot T01-wire time difference for each wire
- Fit Gaussian with exponential tail to each distribution
- Draw a horizontal line at 1/10 of the peak to determine T0 and width
- If fit was not succesful, assign T0 and width averaged over the plane

Results for run 12346







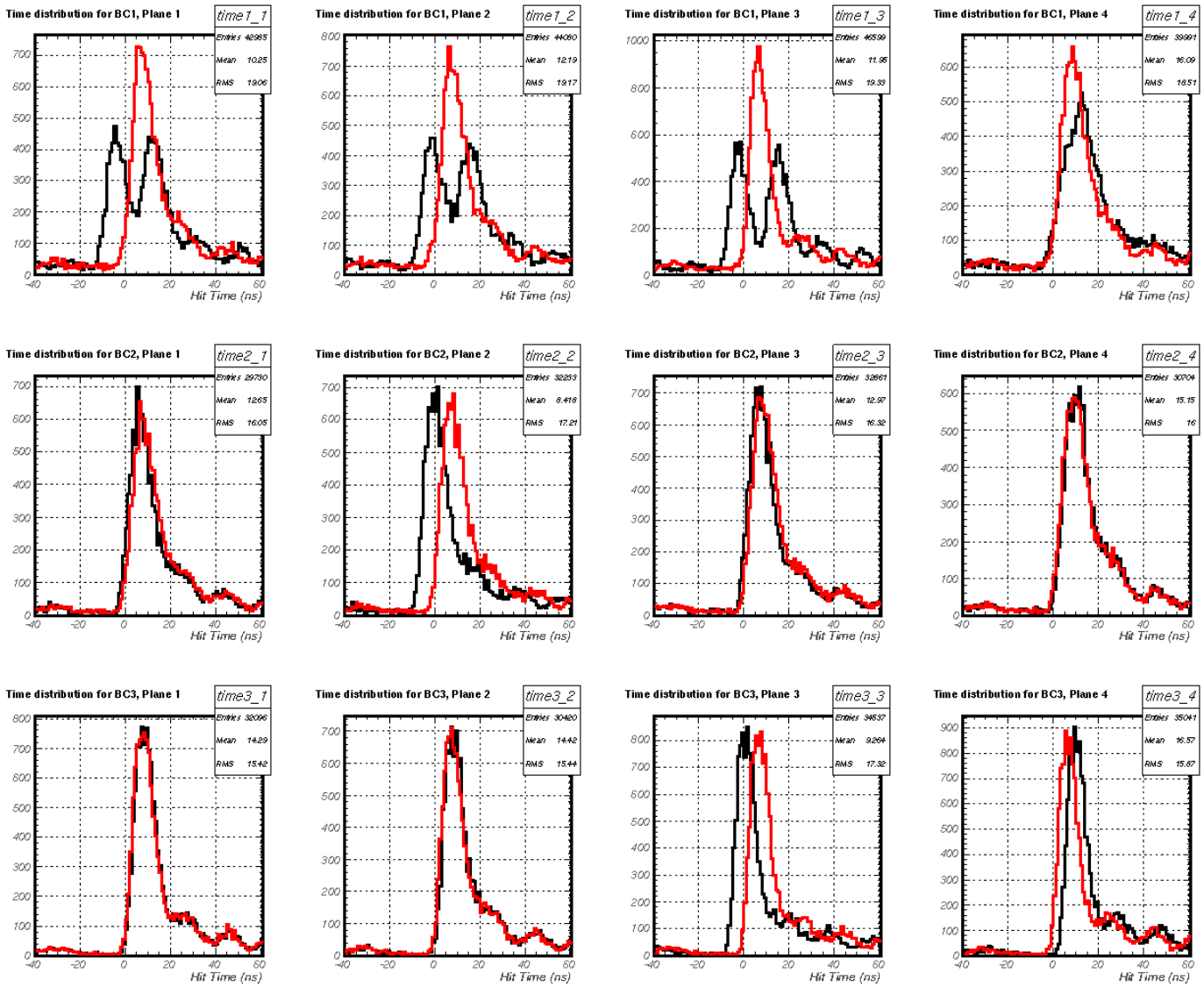


Run 12346 (cont.)

BC Fit Results

Black – hit time with one constant per chamber

Red – hit time after calibration



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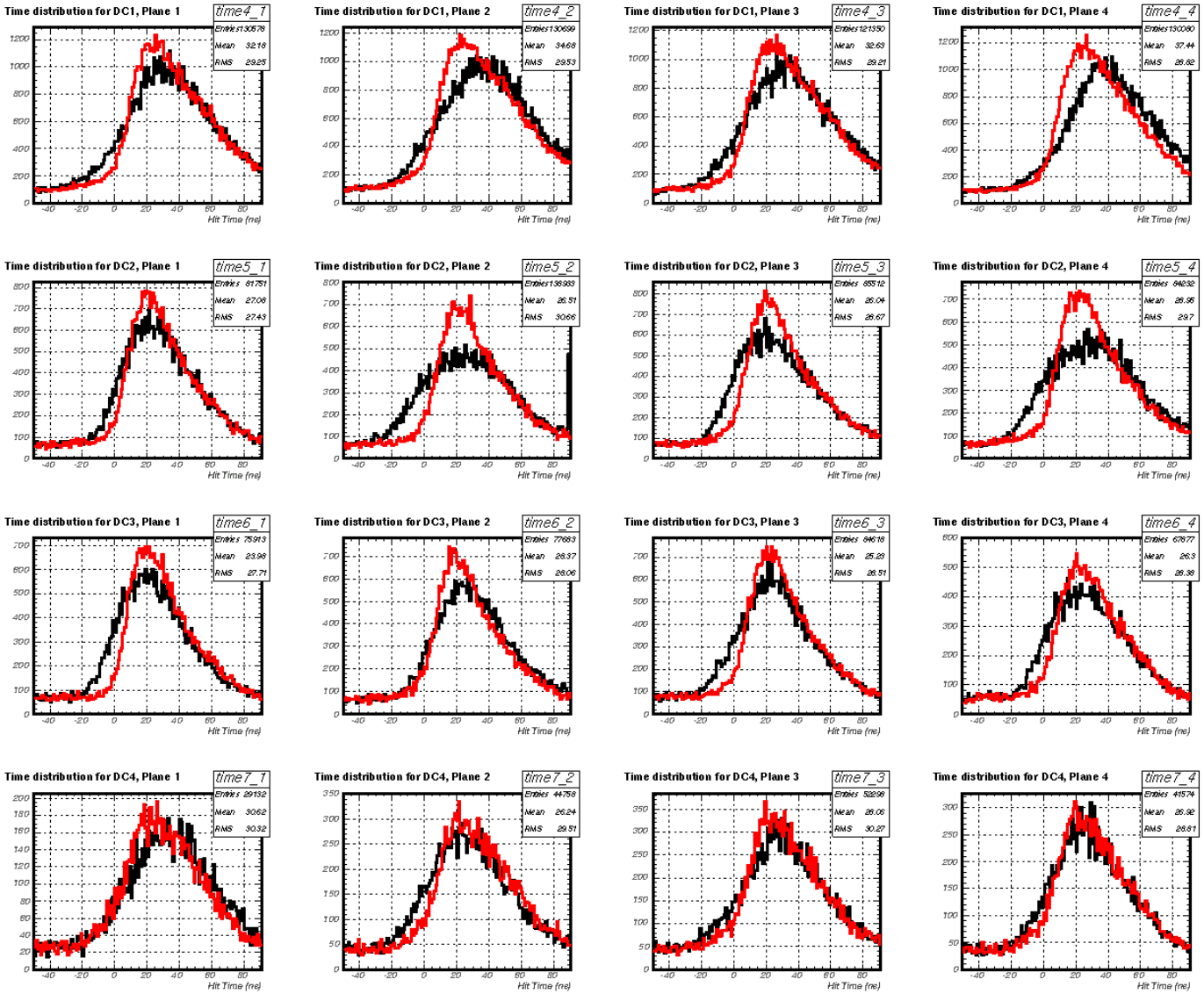
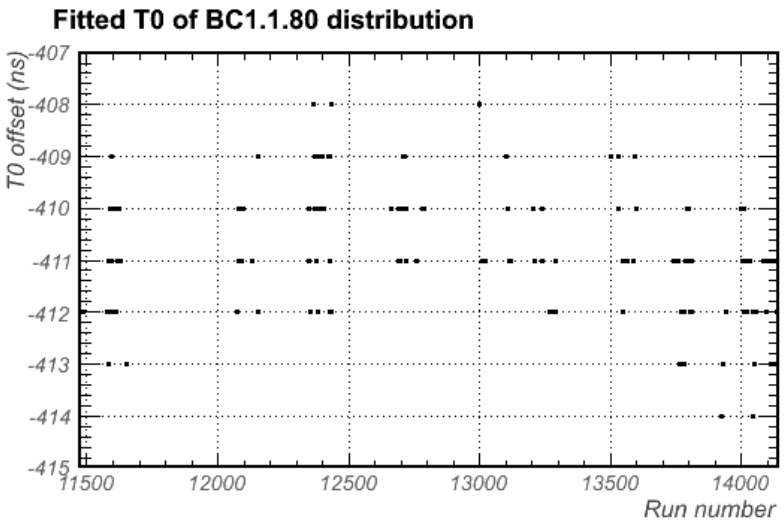
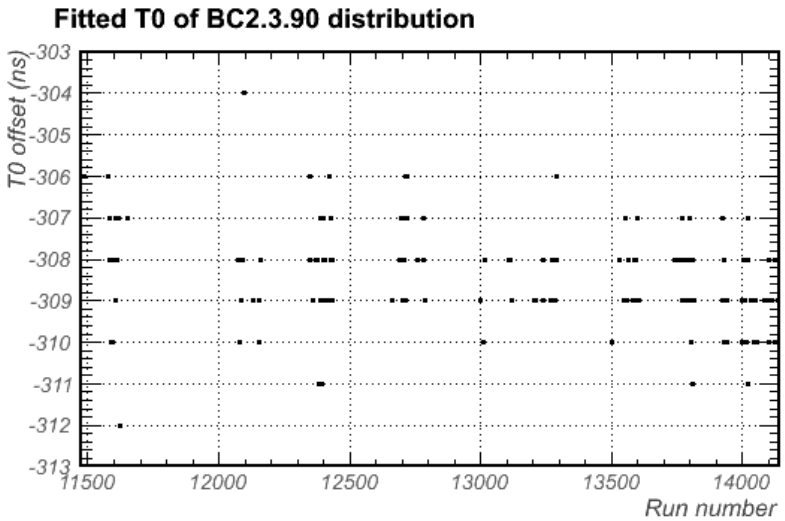
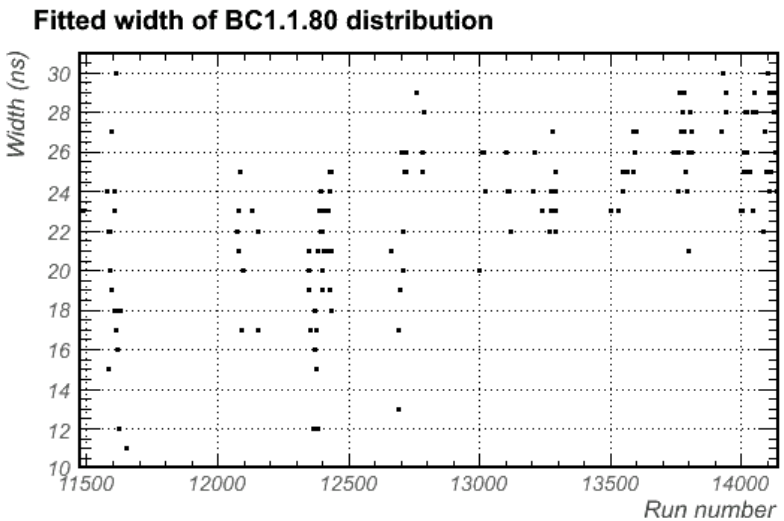
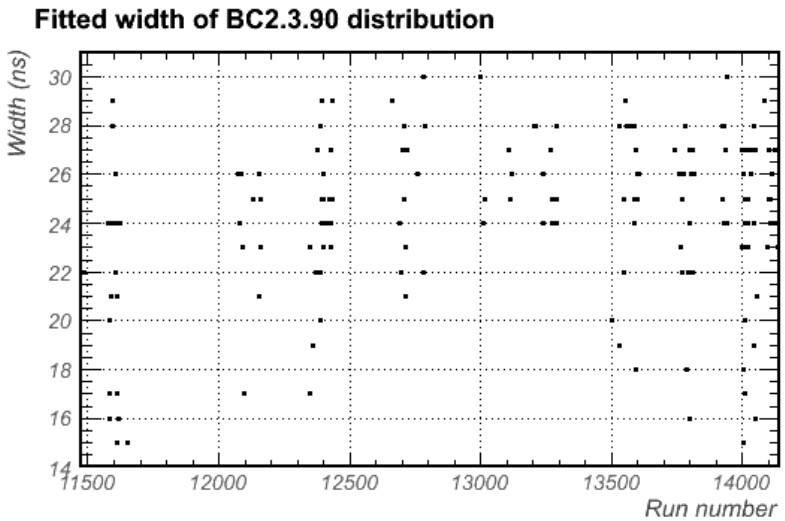


Time variation of fit parameters

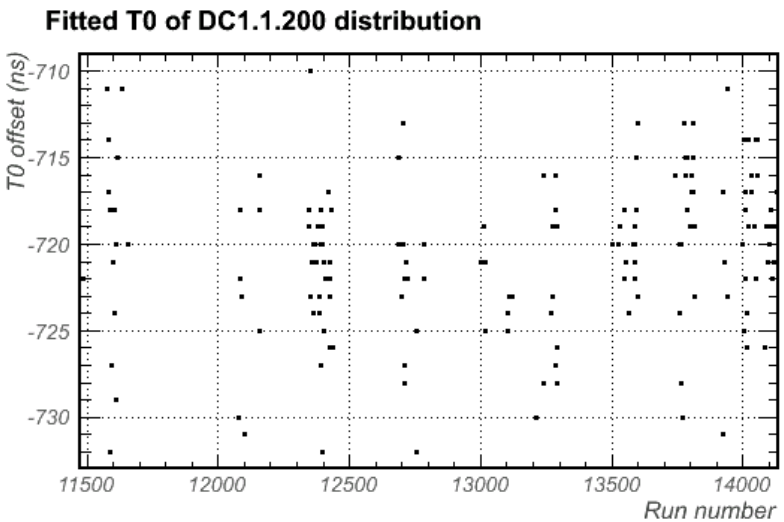


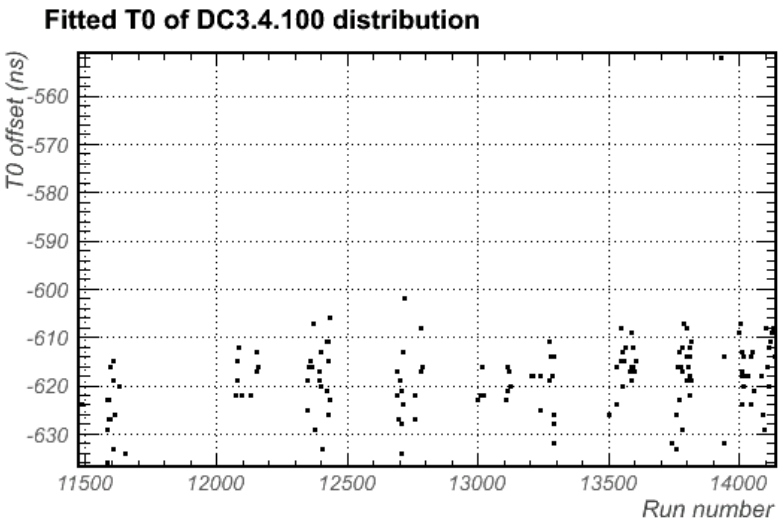


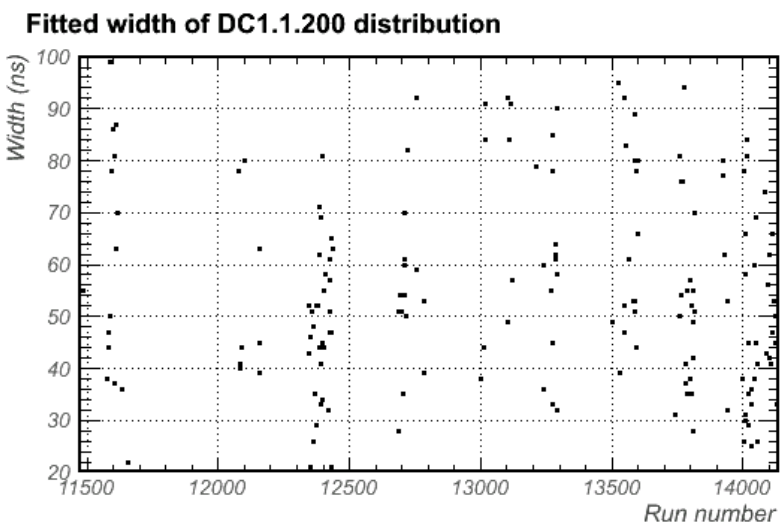


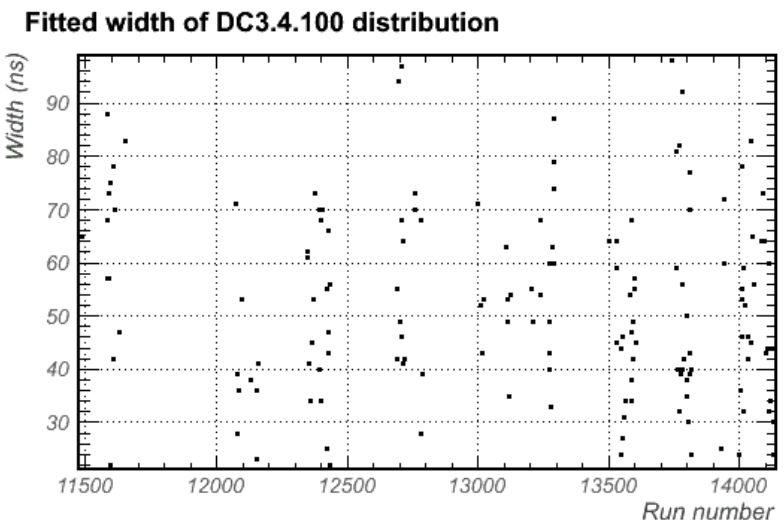


Time variation (cont.)







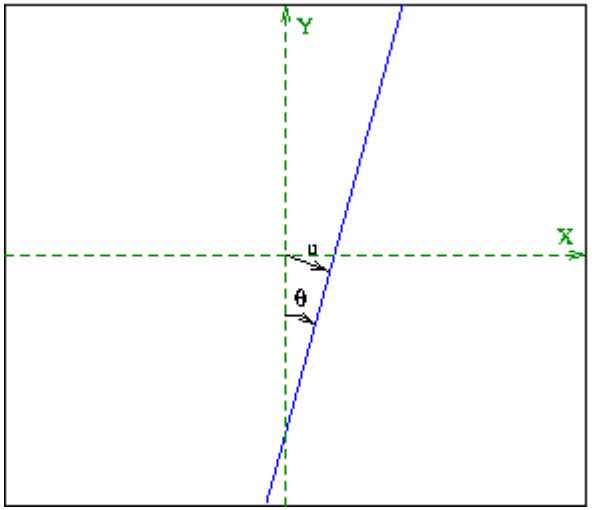


Generalized Chamber Geometry

- We used to have GDCGeom and GMWPCGeo
  - Neither was using MIPP geometry, both were clunky in their own way
- Last week we decided to create GChamGeo
  - All chambers have 4 planes and N wires
  - The class can tranform local to cave coordianates (and back)
  - Get wire coordinates of wire ends
  - Get two-wire crossings

Chamber Geometry (cont.)

- GChamGeo can
  - Convert global (x,y) to u
  - Convert wire to u
- Chamber views are defined
  - U,V,S,T for DC's & BC's
  - X,Y,A,B for MWPC's
- Implemented in EventDisplay and TrkRBase
  - Other classes that use chambers will soon follow



- *u – distance from global origin to wire points; positive along x- or y-axis*
- *θ – wire angle w.r.t. vertical [-90°, 90°)*

TrkRBase

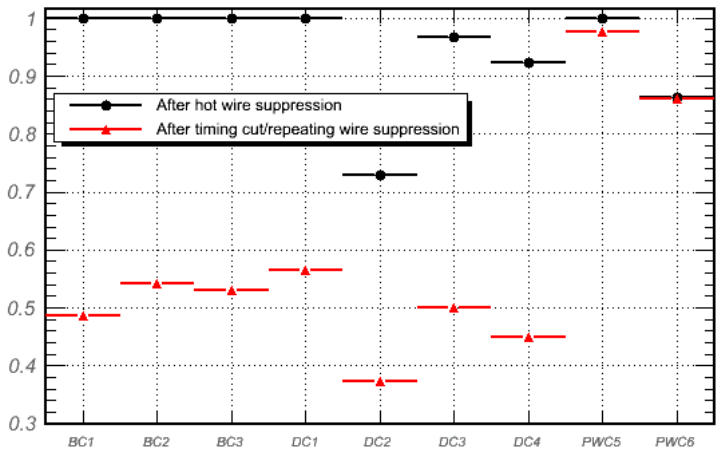
- Meant to provide a framework for chamber reconstruction
- Takes digits, uses calib DB entries to suppress hot wires and applies time calibration – writes Wire's to Cal bucket
- Forms clusters of adjacent Wire's – WireClust's
- Groups WireClust's into WireCross'es – 0 or 1 WireClust allowed per plane

TrkRBase (cont.)

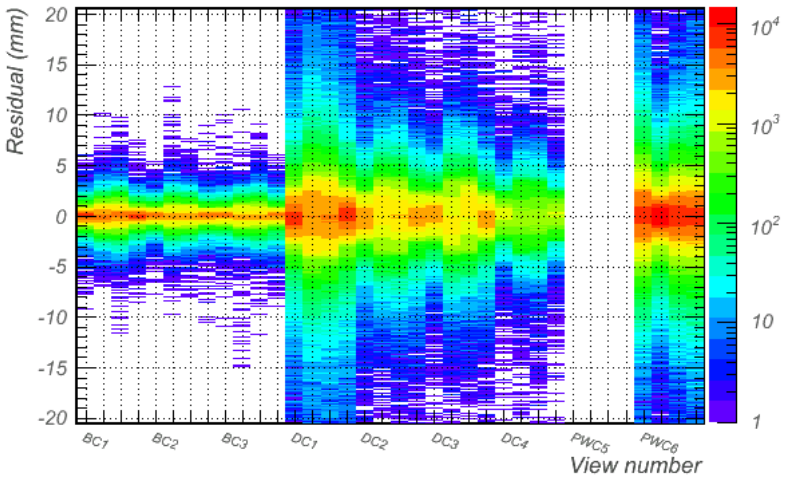
- Take WireCross'es and form TrackSeg's – straight-line track segments including WireCross'es in at least 2 chambers
- TrkRUtil – implement some commonly used algorithms:
  - PredictXY(): calculate (x,y) at z based on 2 points on a straight line
  - FitLineFromWires(): generalized LSQ fit
- Everything is working to 0th order

Filtered wires, Clusters, Crosses

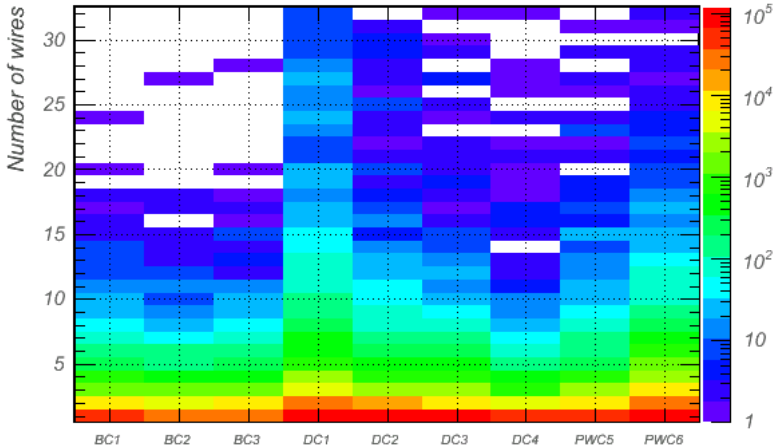
Fraction of wires left after TrkWireFilter, run 12346



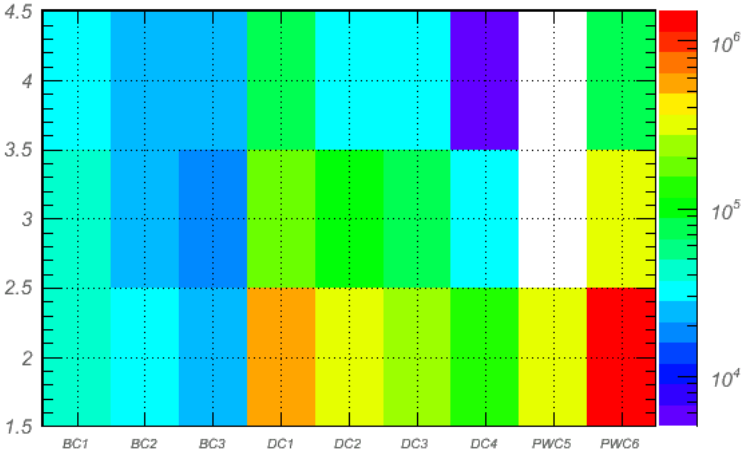
Residuals for 3+ cluster cross fit, run 12346



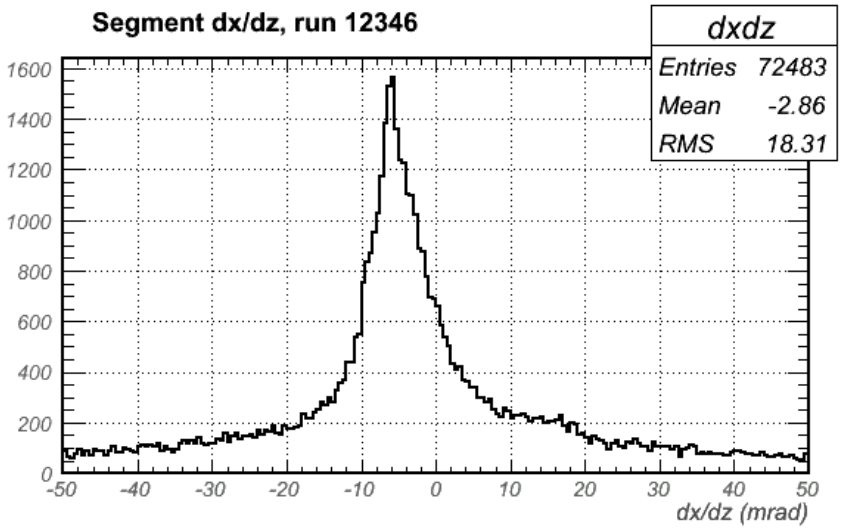
Number of wires in clusters, run 12346

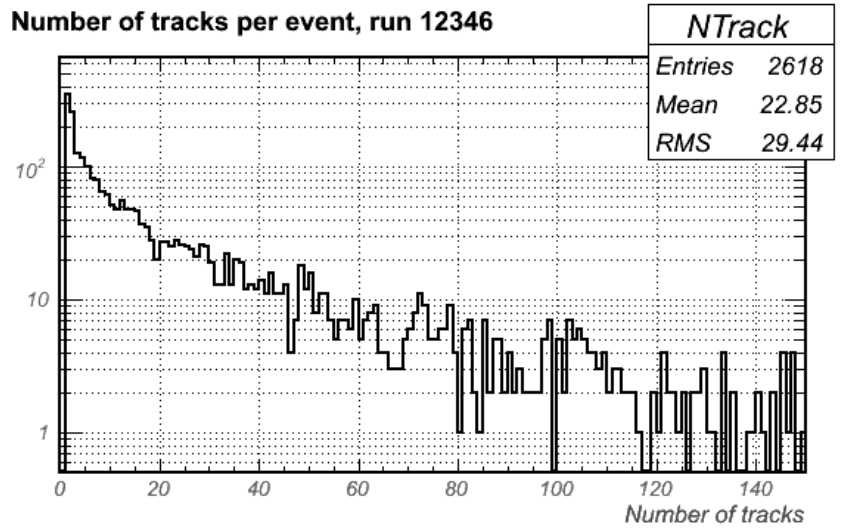


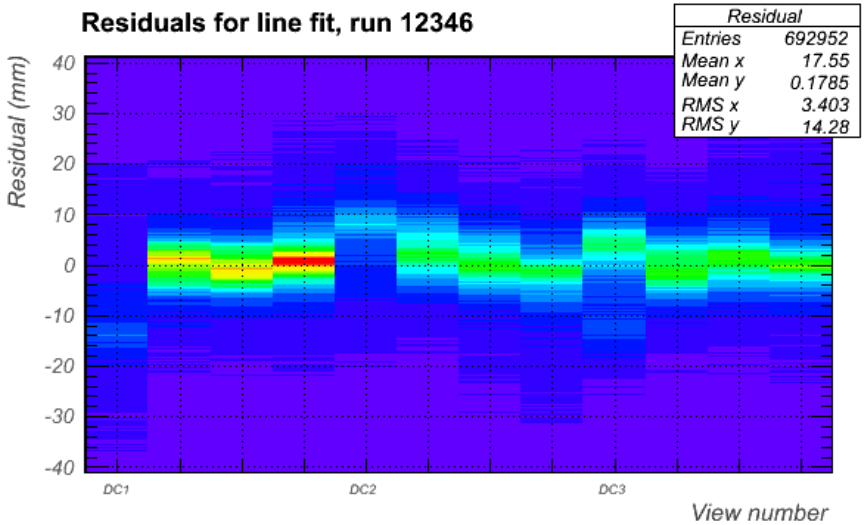
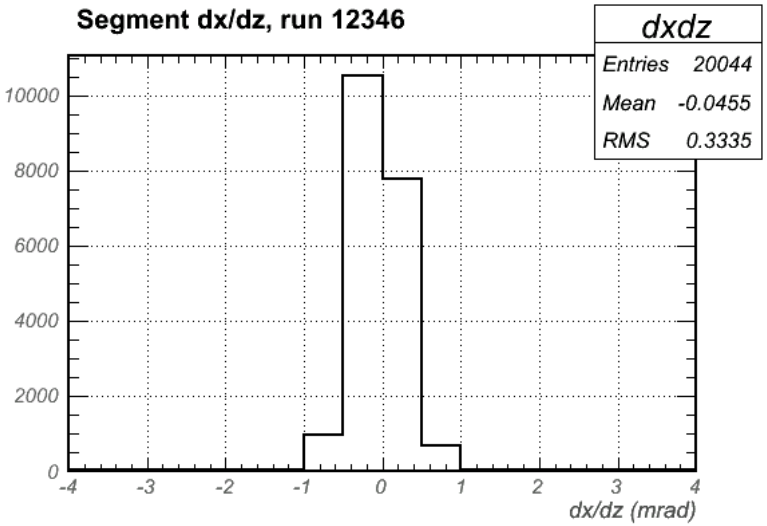
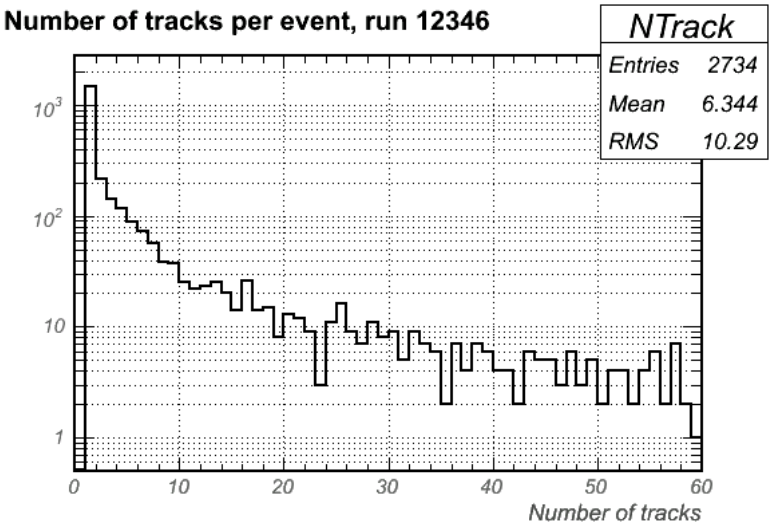
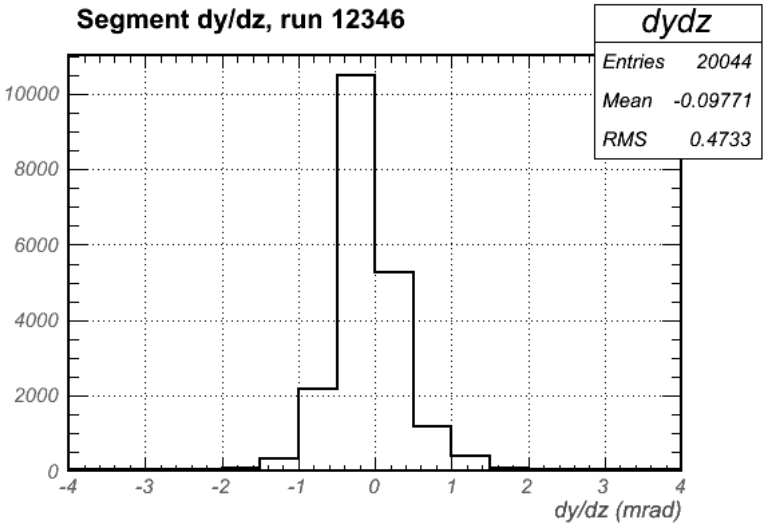
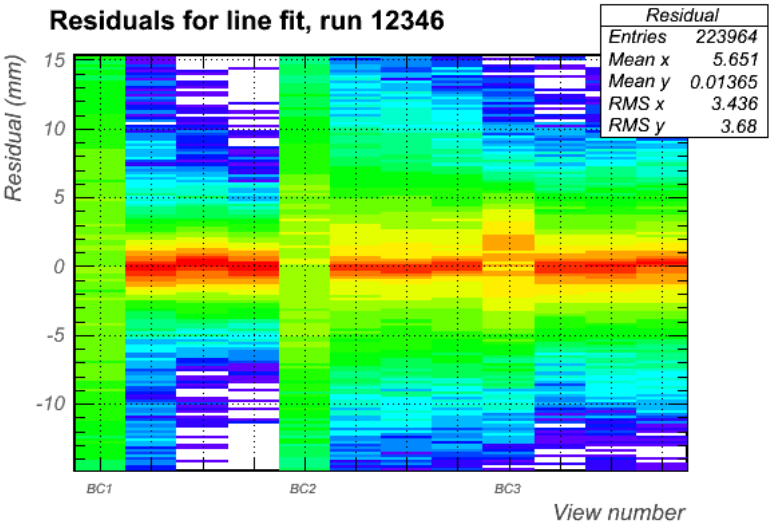
Number of clusters per cross, run 12346



DC123 Tracks







BC123 Tracks