Improvements to L3 Tracking in p11.06.00

Robert Illingworth

Imperial College, London

New and improved features in p11.06.00

L3GeometryManagement

- Allows us to instantiate full (aligned) offline geometry in L3

L3TSmtUnpack

- Fully dynamic crate/VRB configuration, parameterised pedestals, and noisy strip killing

L3TGlobalTracker (Daniel Whiteson)

- Axial CFT tracks can no be extended to use stereo SMT hits

L3FTrack

- Filter on tracks: require n tracks above p_T threshold

Plus existing improvements to L3TCFTUnpack

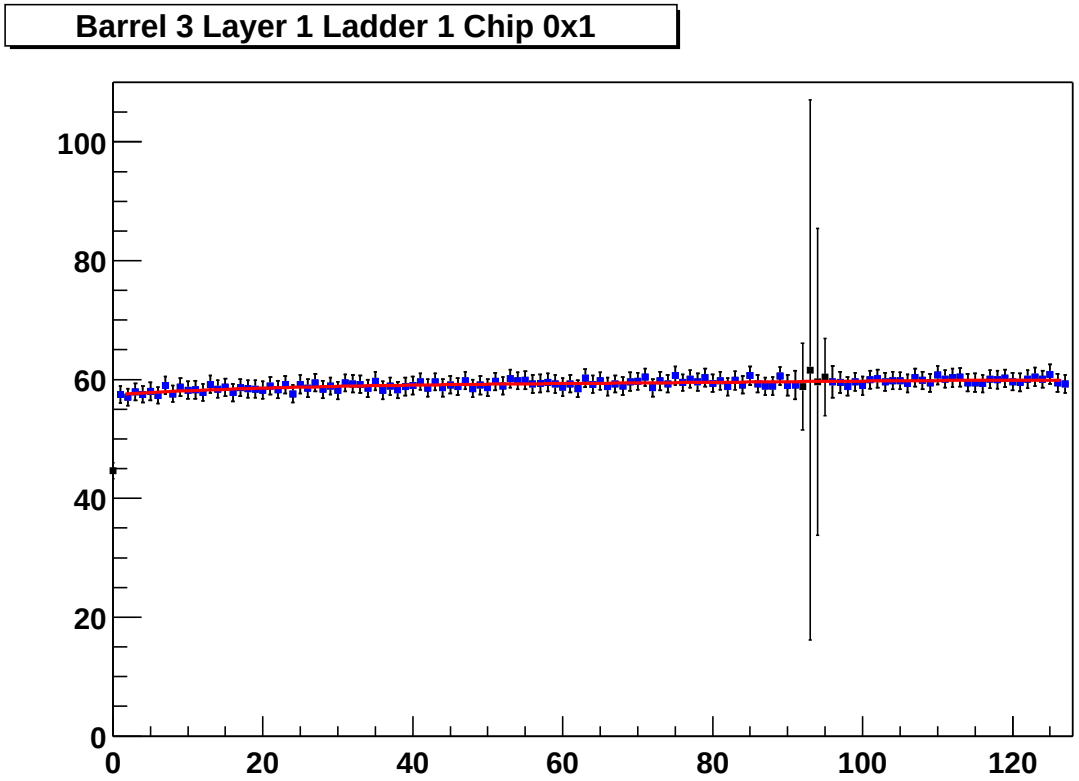
L3GeometryManagement

- Tool to instantiate the full offline geometry – before we were stuck with the idealised RCP based geometry
  - Take advantage of the work done on alignment
- Actually using the full geometry is relatively slow, so then extract the values we want to use into a lookup table
  - still make simplifying assumptions – silicon ladders are flat, CFT axial fibres are exactly axial, etc.
- However, the relative alignments of the subdetectors should now be much better

L3TSmtUnpack

Fully dynamic crate/VRB configuration (old version needed to be told the correct crates)

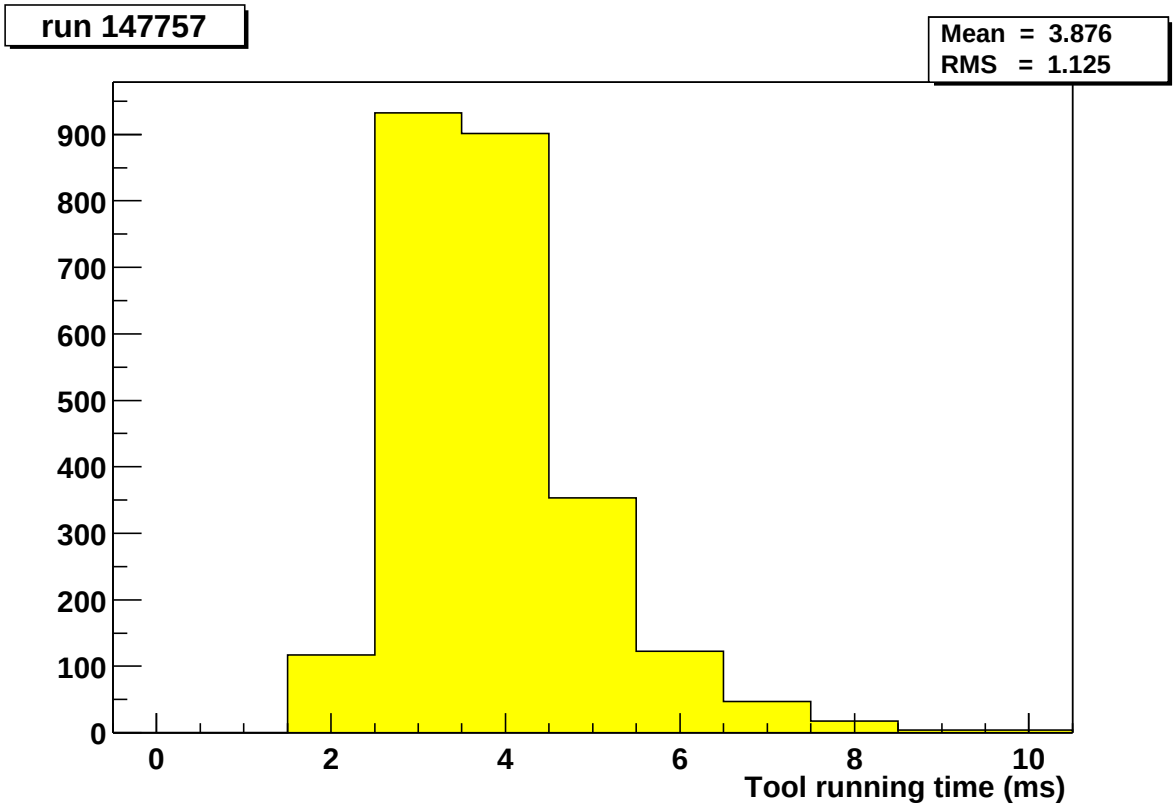
Improved pedestals and noisy strip removal



SMT unpack timing

SMT unpack & cluster time (barrels only) running on 1 GHz Linux machine on real data

- Writes complaints about the data to the logfile, which takes some of the time…

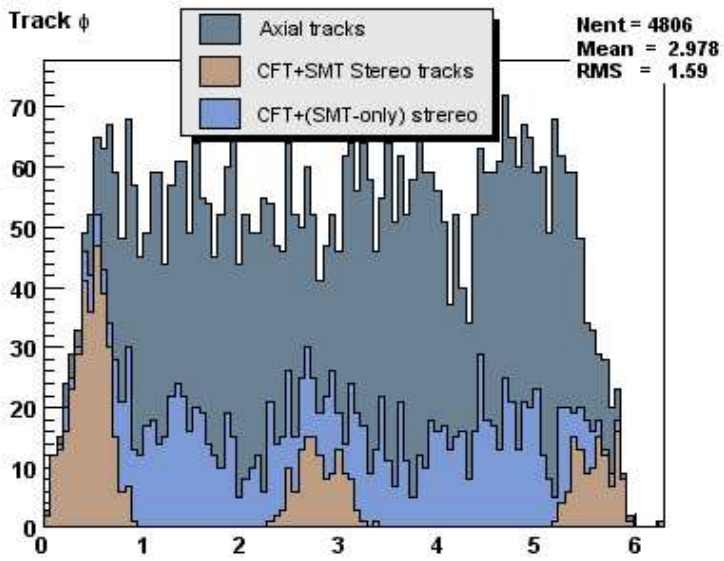


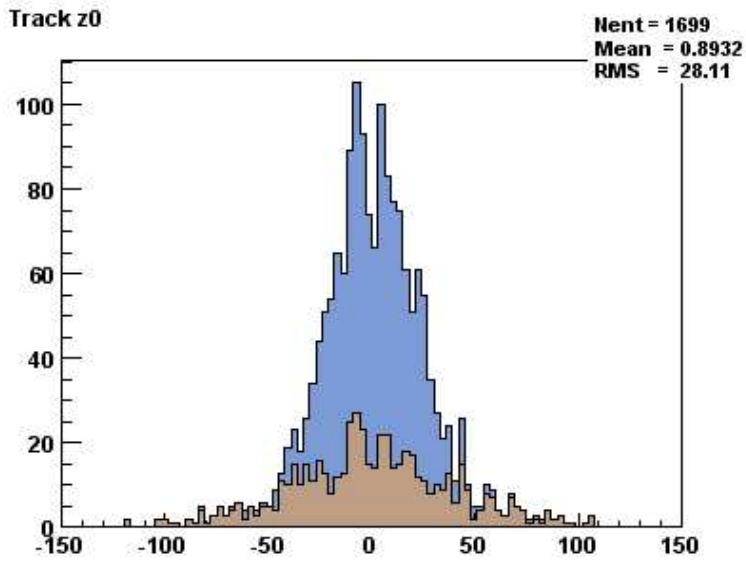
L3TGlobalTracker

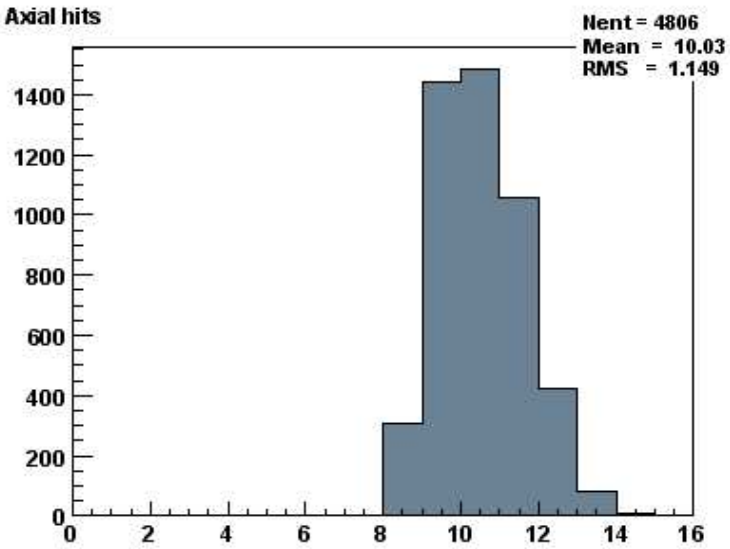
Daniel Whiteson

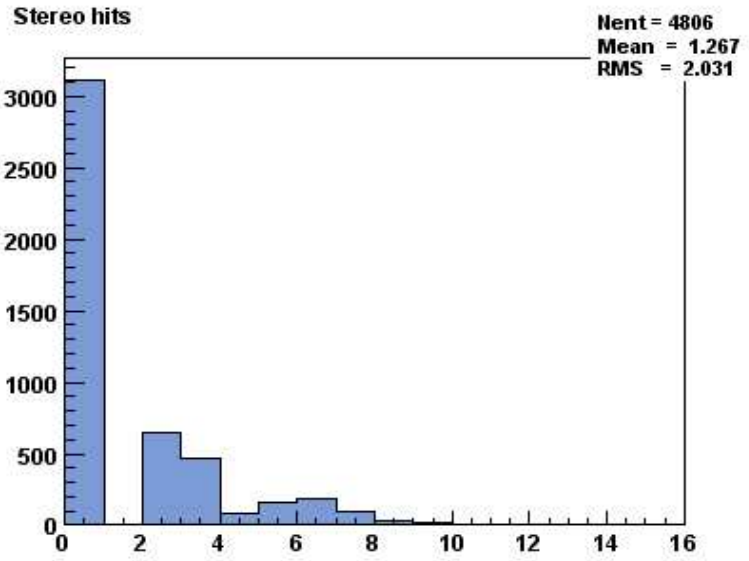
- The stereo tracking in previous versions was limited because stereo CFT hits were required
  - Number of stereo tracks found was severely limited by the limited region of CFT stereo coverage
- New facility added to allow SMT only stereo tracking on CFT+SMT axial tracks
  - Invoked if CFT stereo fails
- Significant improvement in number of stereo tracks found

SMT stereo tracking





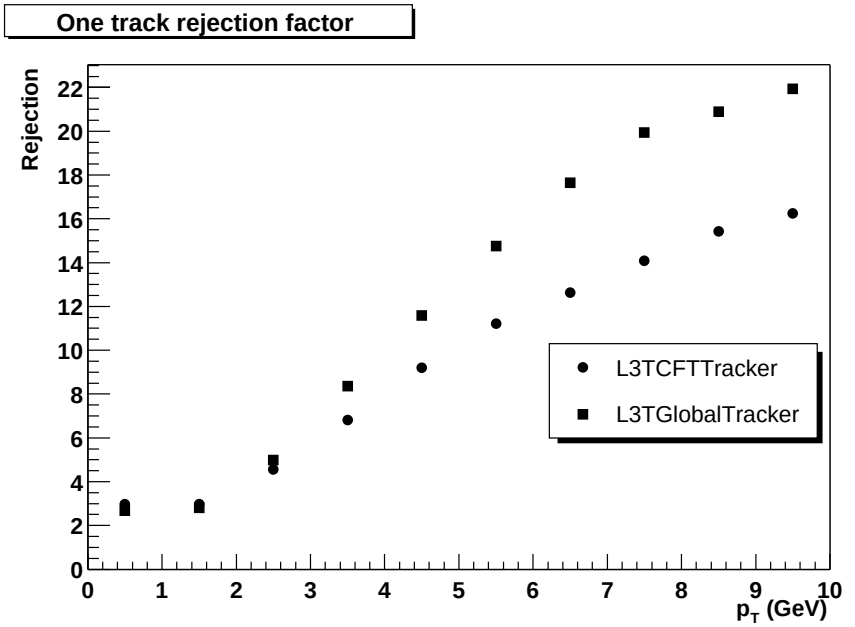


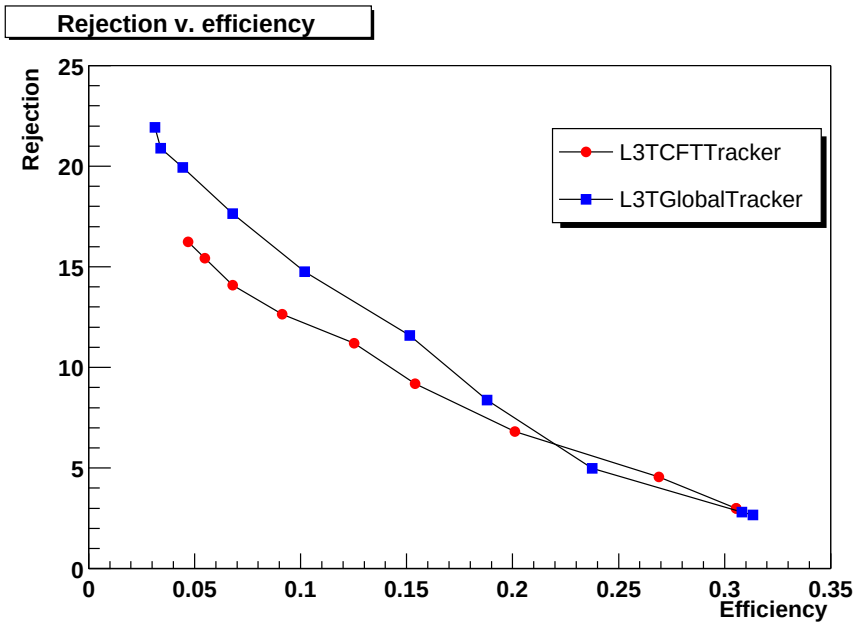


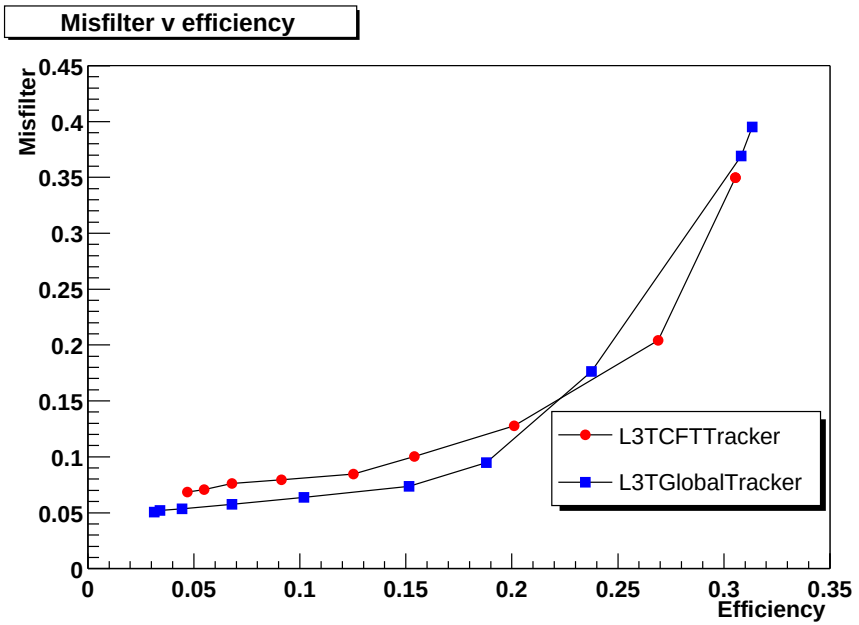
L3 track filtering

Now have a track filter – require n tracks above p_T threshold

Still needs to be studied – some inconsistencies in the results







Conclusions

Tracking in p11.06.00 will be ready to be run online

Geometry, SMT unpack, CFT unpack, CFT track and Global track tools are all available for use

Track filtering will be available – needs further study to determine its effectiveness

Ready to try things out for real…