XFT efficiency studies

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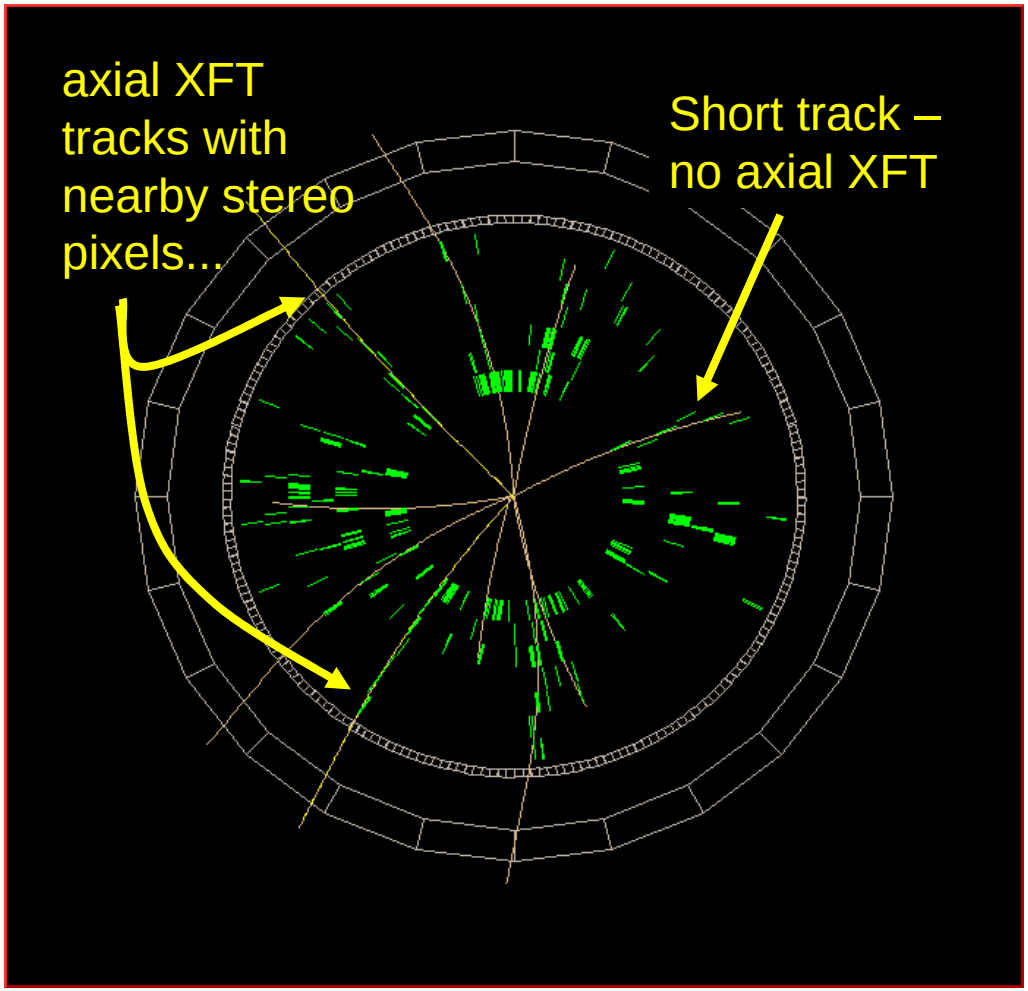
- First look at data in run 0x35a19
  - Analyzed file dr035a19.0001phys from the look area
  - Used tracks from Level 3 summary bank
- Two goals:
  - Look for stereo pixels on tracks (qualitative)
  - Measure efficiency (quantitative)
  - Are these vaguely consistent?
    - Right now I'm not sure they are...

Example event display

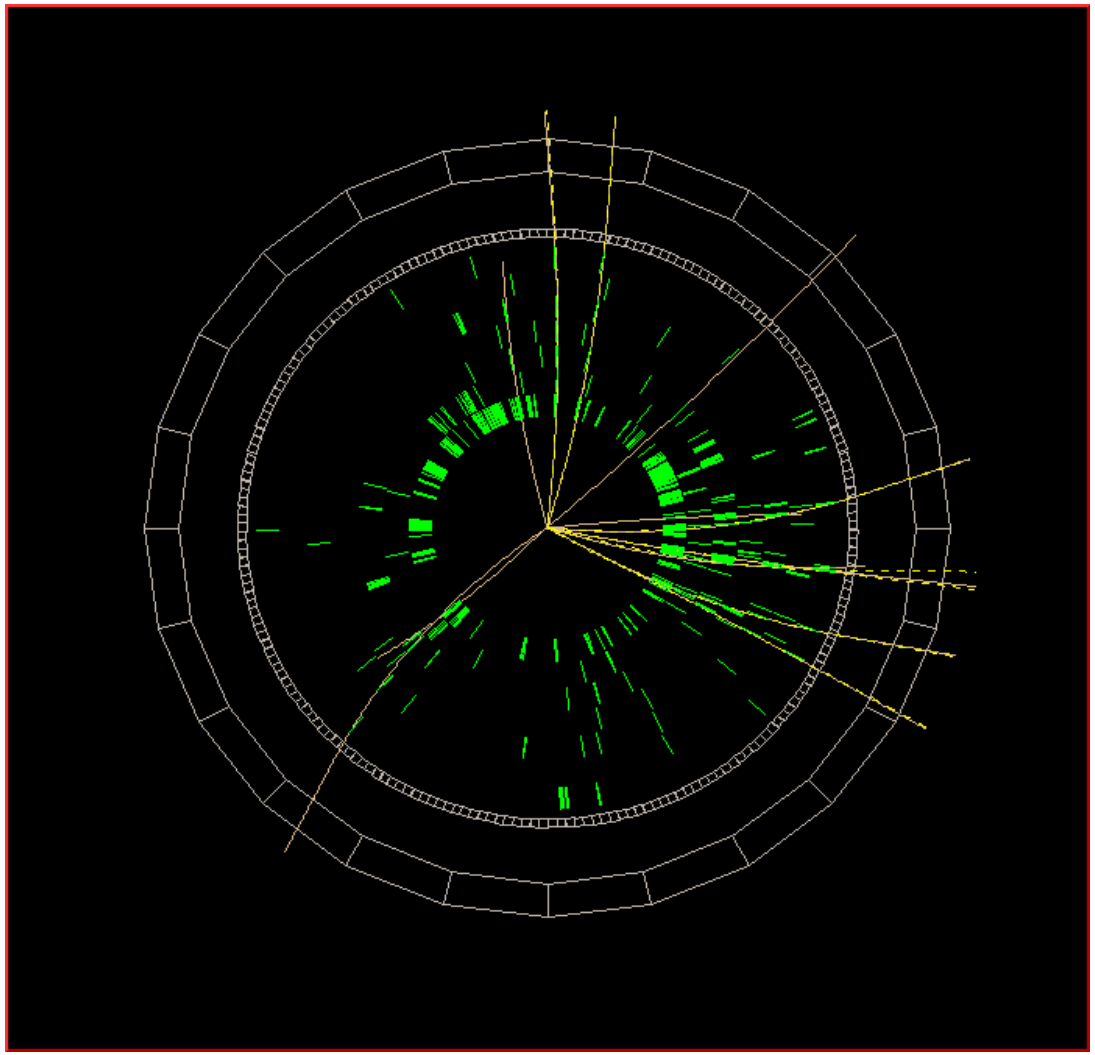


Based on track/XFT quantities in n-tuple

Main things to look at:

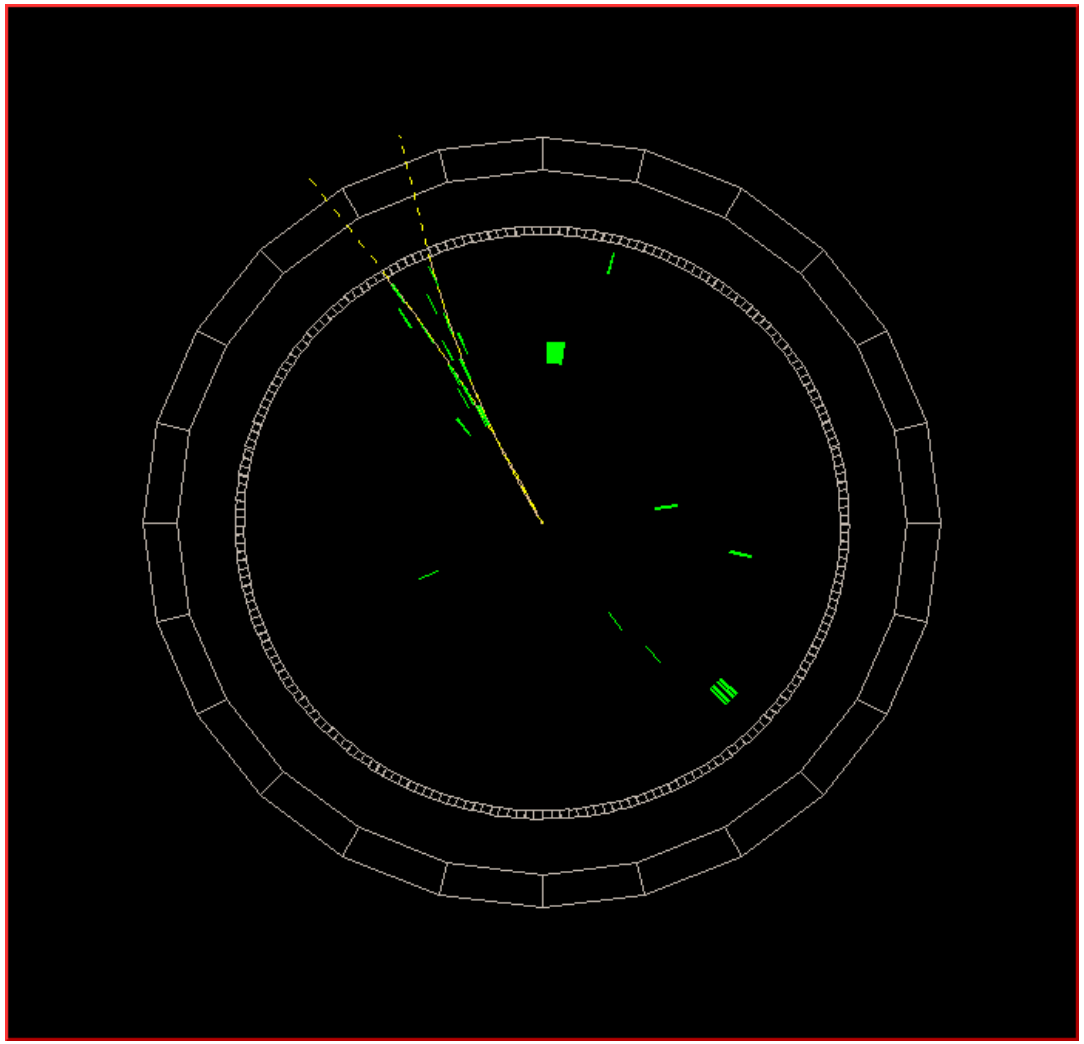
- tracks from Level 3
- axial XFT tracks
- cells containing axial/stereo pixels

More Unbiased Event Pictures



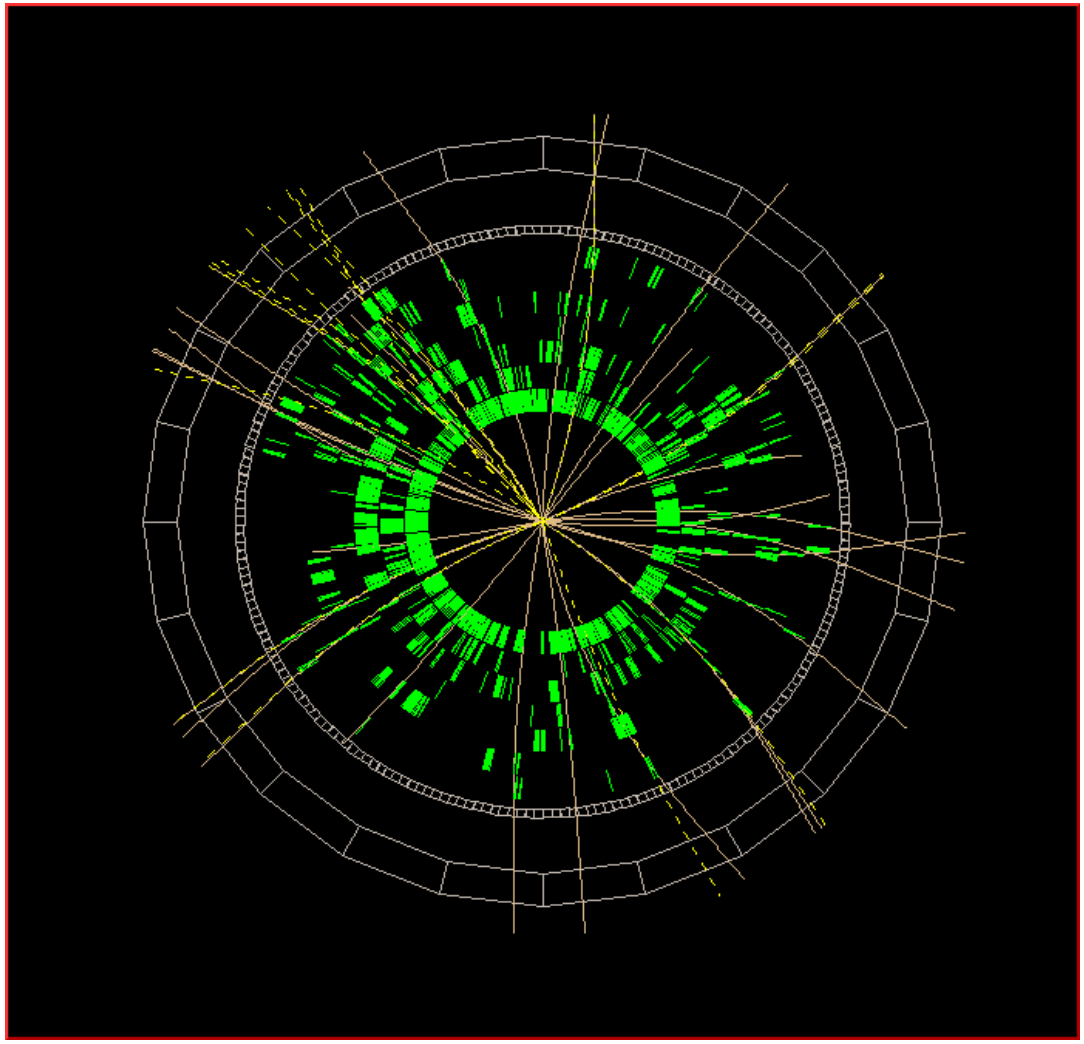
Event 219673/5

More Unbiased Event Pictures



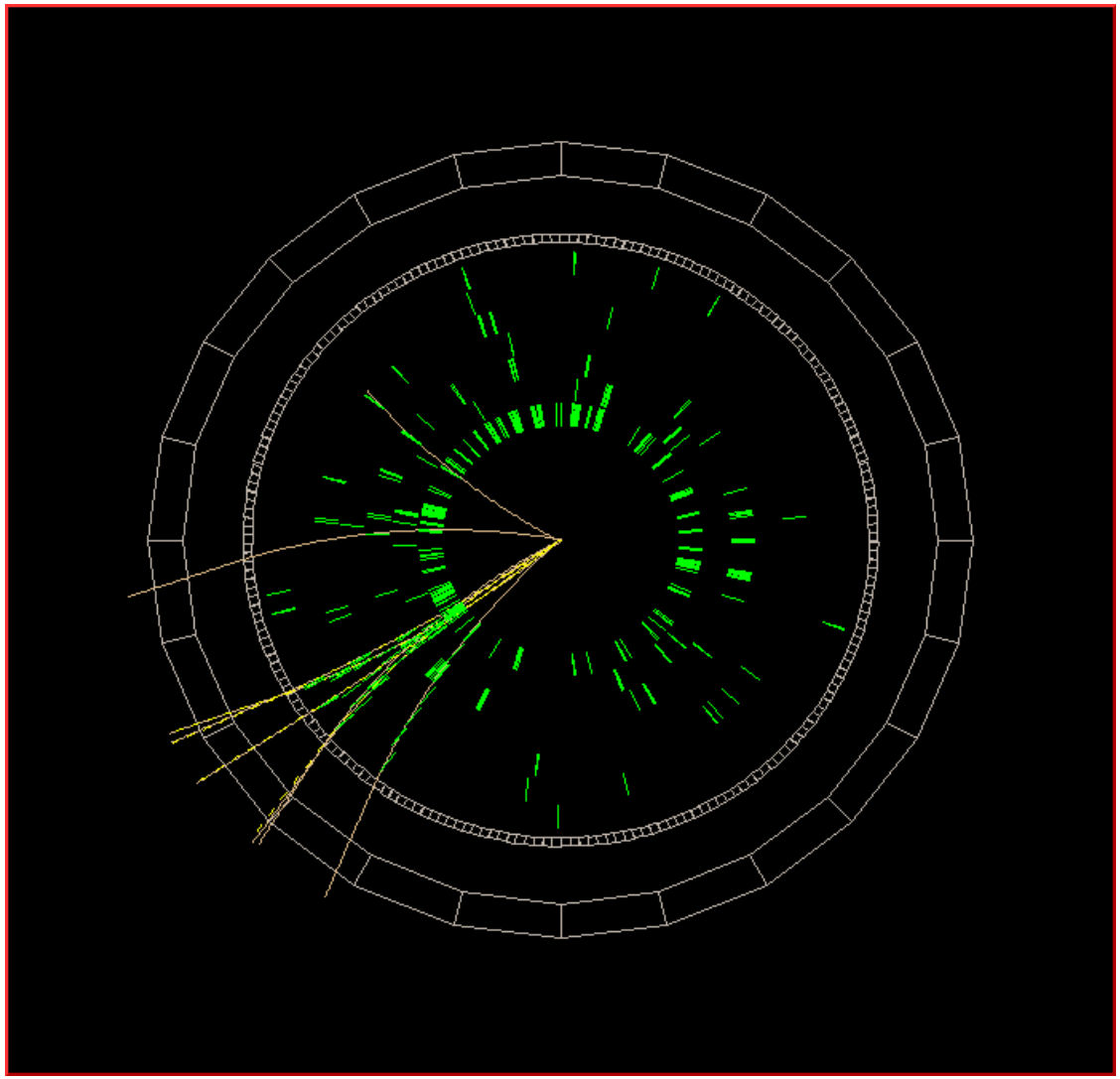
Event 219673/94

More Unbiased Event Pictures



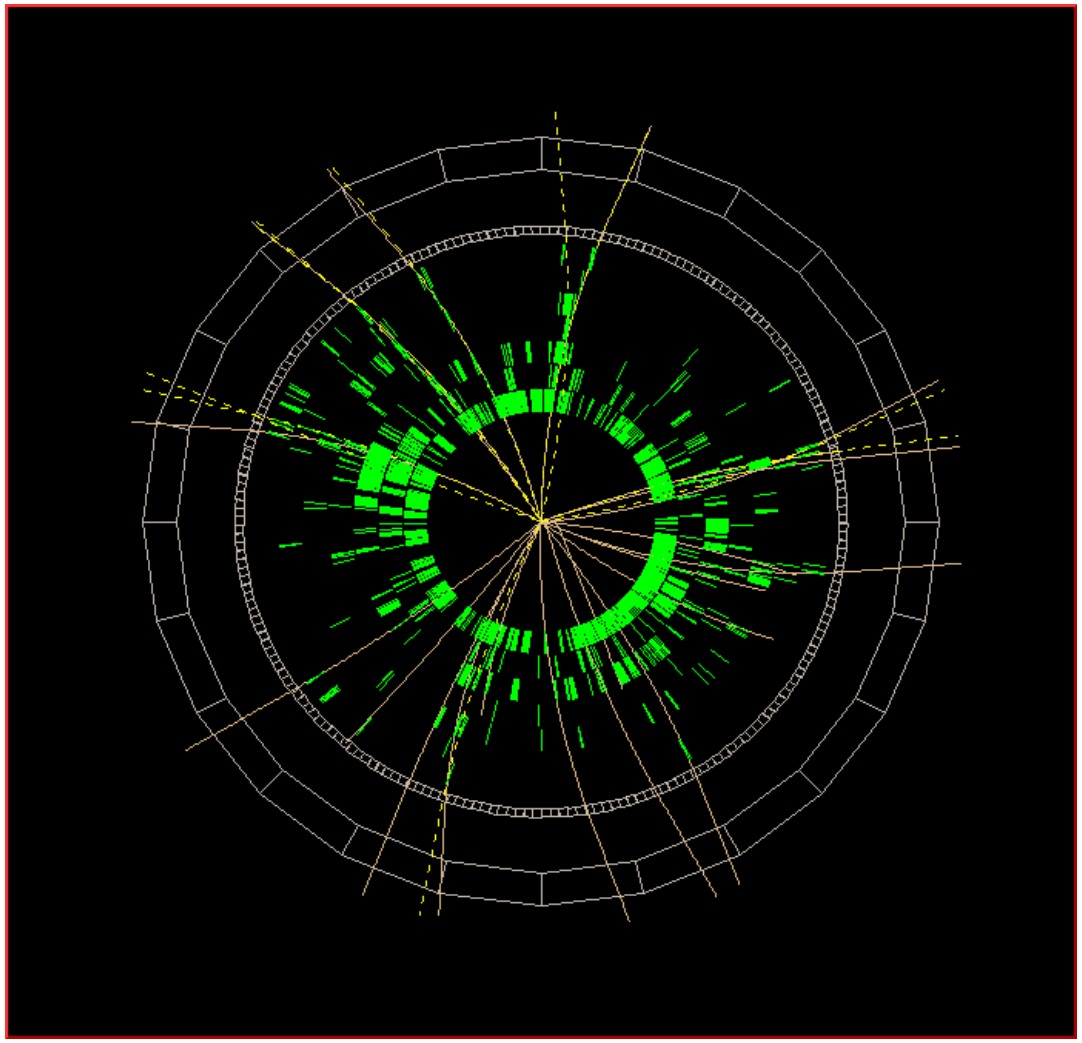
Event 219673/95

More Unbiased Event Pictures



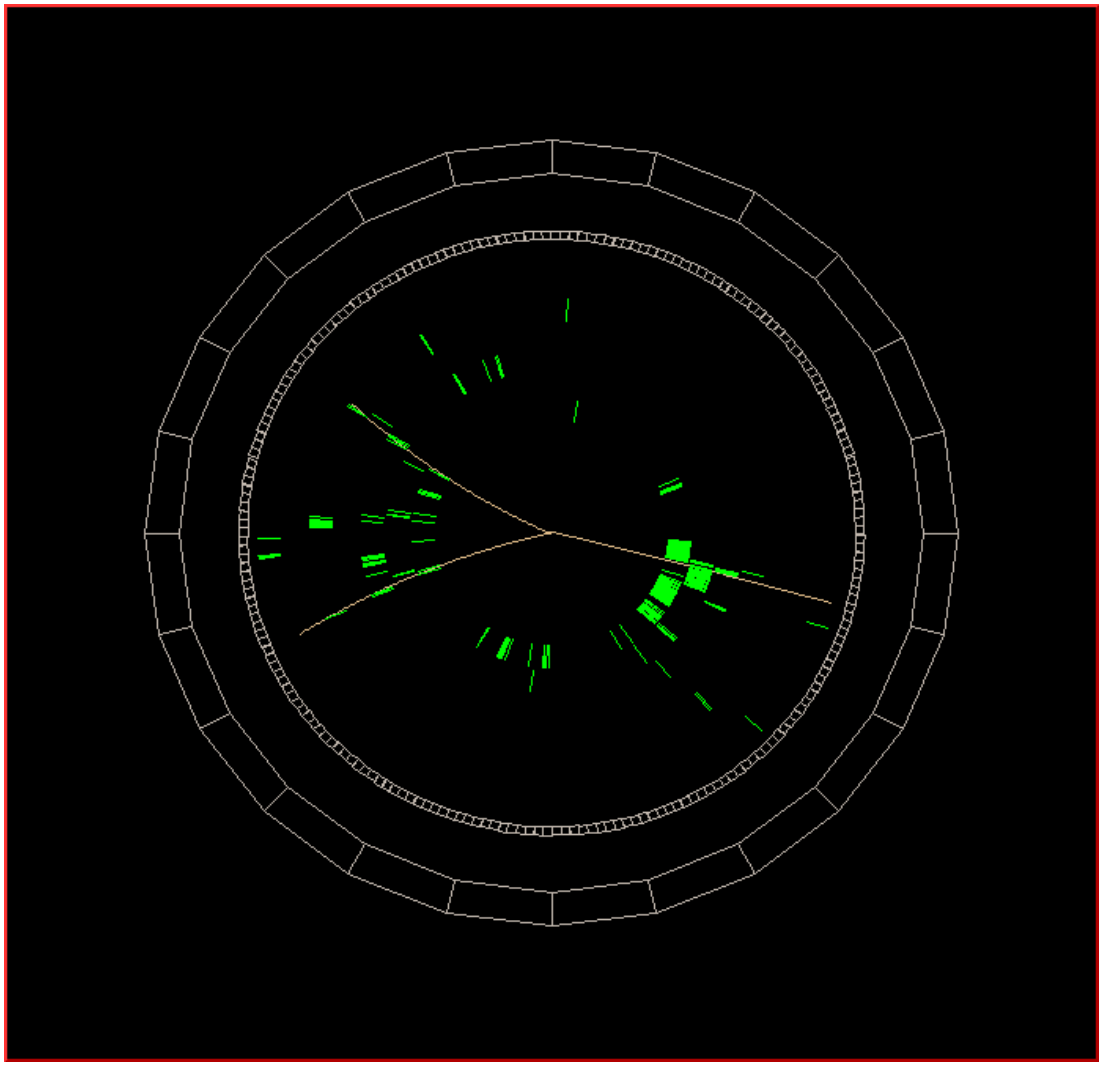
Event 219673/308

More Unbiased Event Pictures



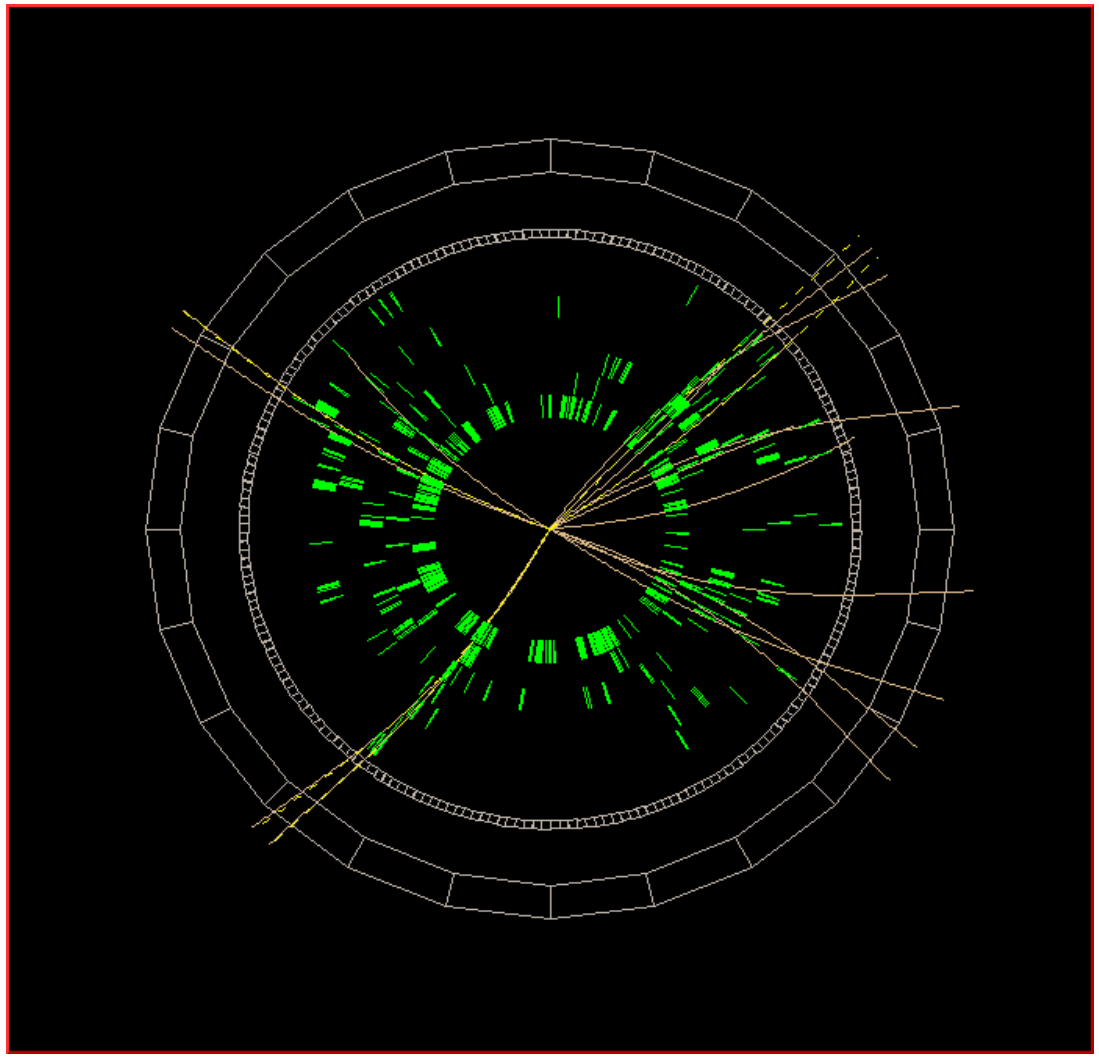
Event 219673/310

More Unbiased Event Pictures



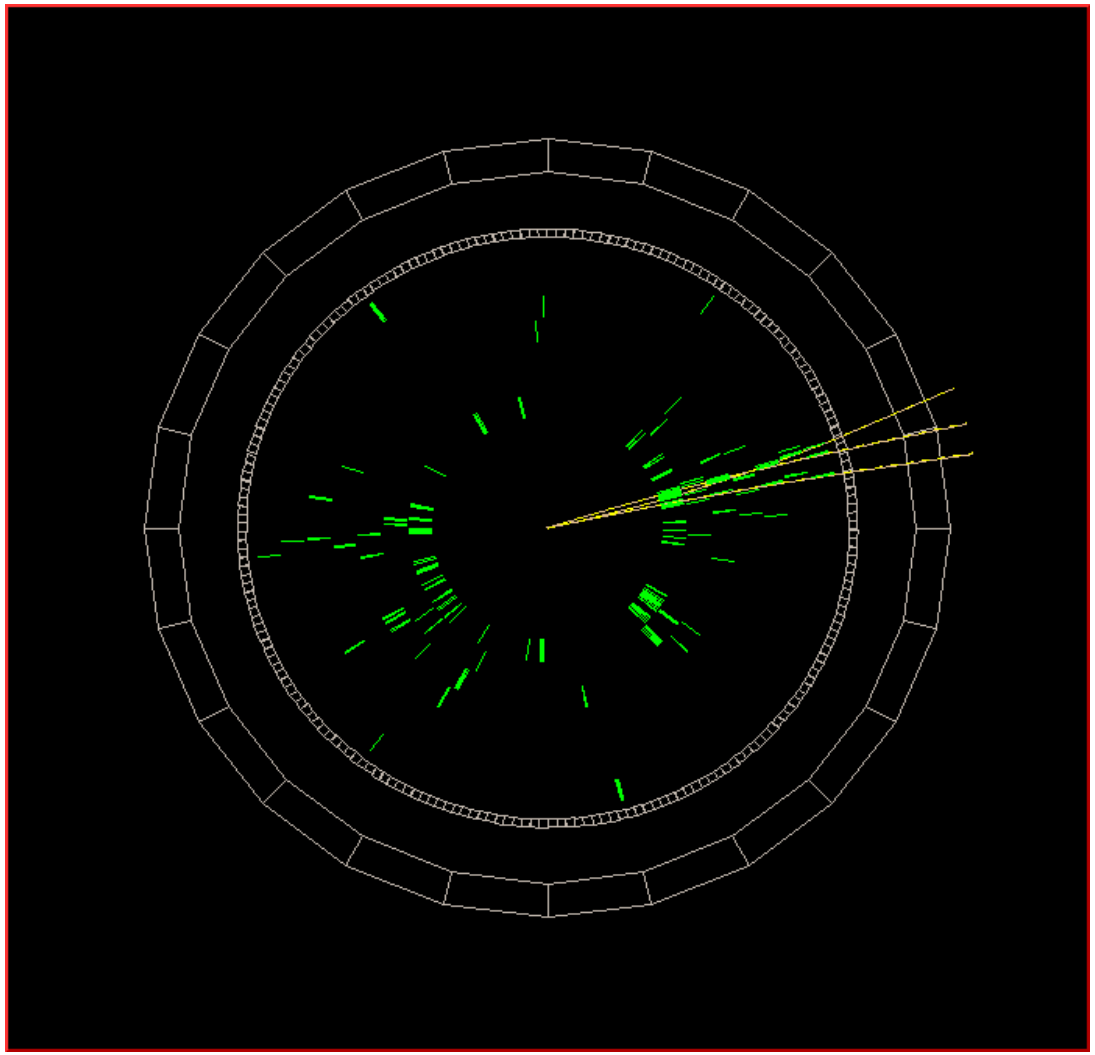
Event 219673/522

More Unbiased Event Pictures



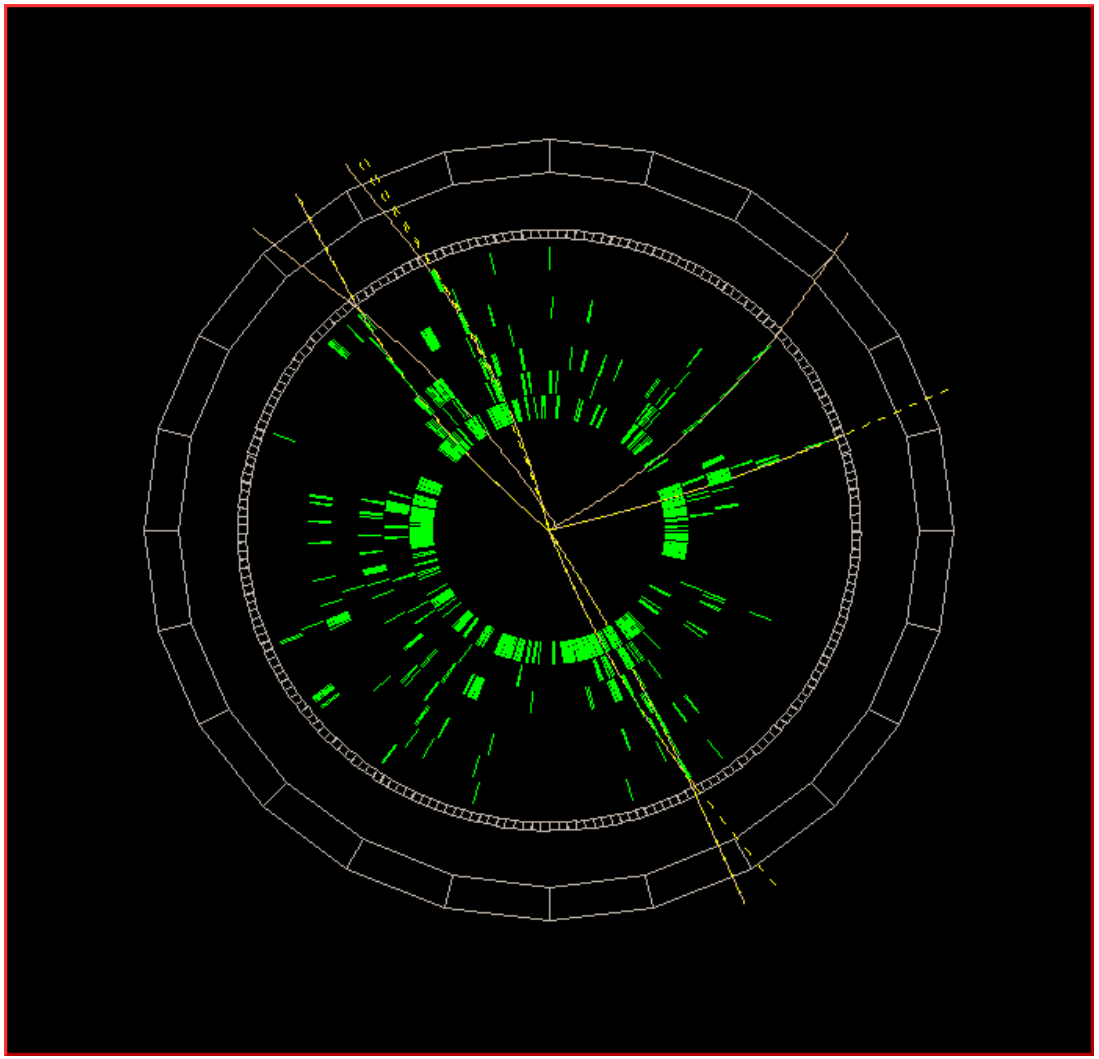
Event 219673/523

More Unbiased Event Pictures



Event 219673/711

More Unbiased Event Pictures



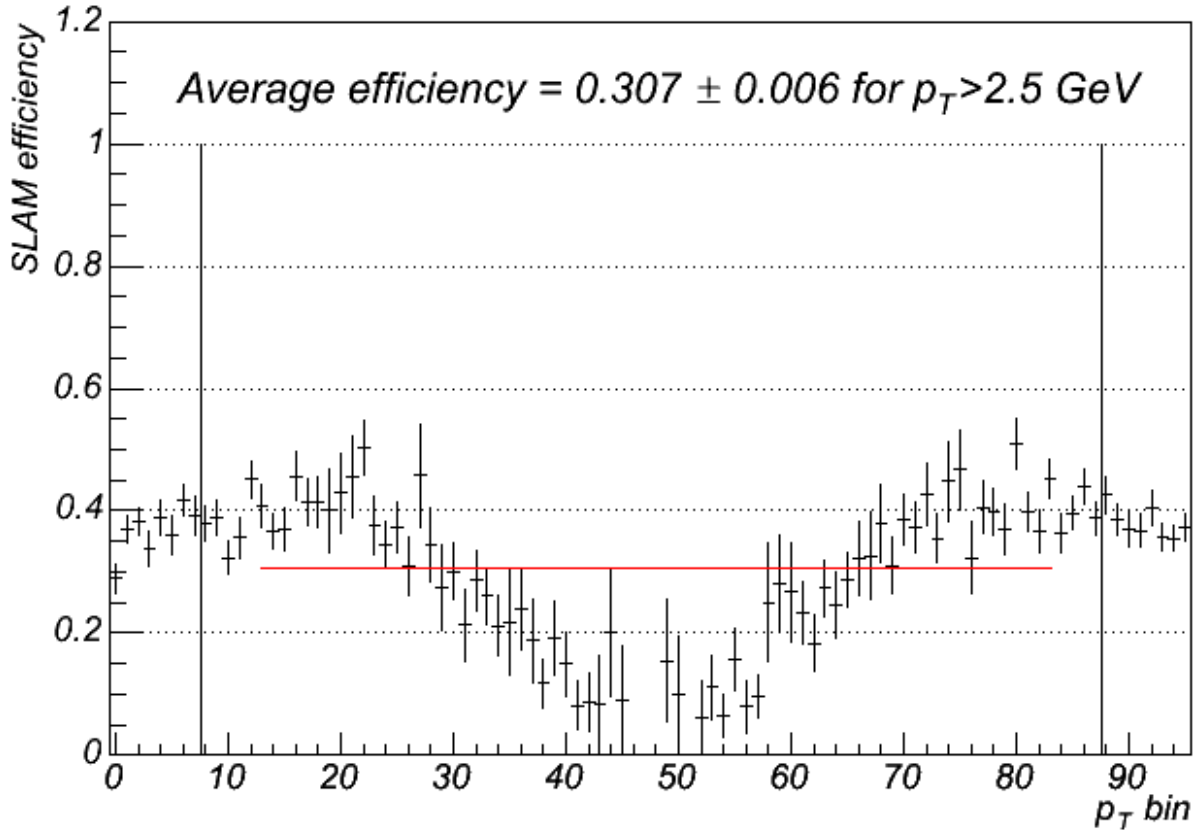
Event 219673/712

Qualitative Observations

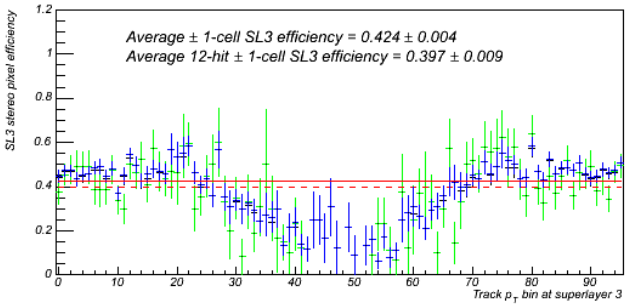
- In general, tracks have stereo pixels near them: expect a reasonable pixel finding efficiency
- Quantify efficiency as done previously:
  - Extrapolate track to stereo superlayer
  - Look for a pixel within $\pm n$ cells of track
  - Plot efficiency as a function of p_T, z, φ in each superlayer

Efficiency Studies

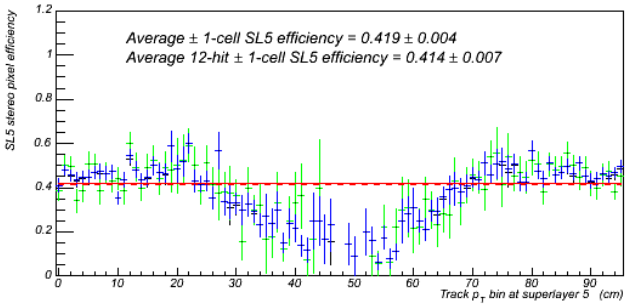
- Average efficiency is not high... also strongly p_T dependent:



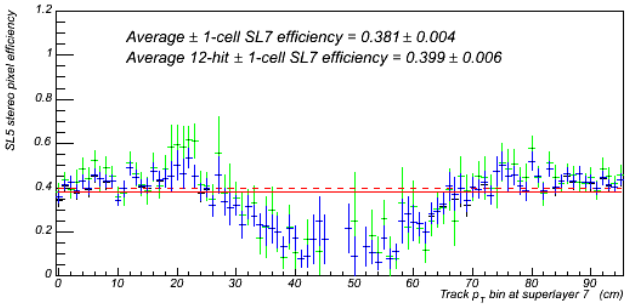
Efficiency *vs* p_T bin



SL3



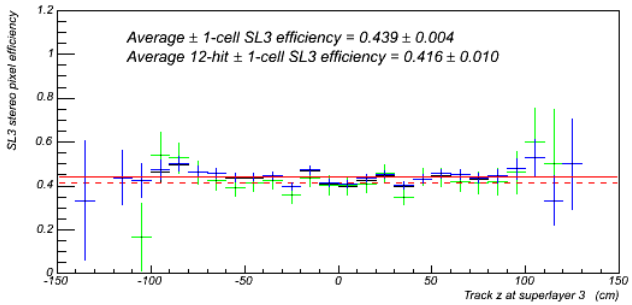
SL5



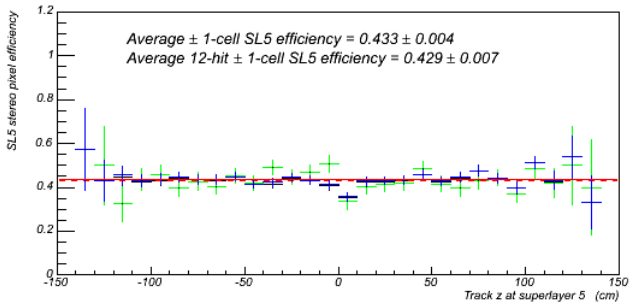
SL7

- Same behavior in all superlayers. No significant difference if we look for a pixel within ±8 cells.
  - seems suspicious...

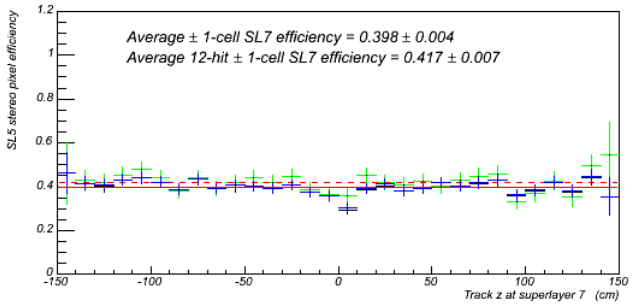
Efficiency *vs* z



SL3



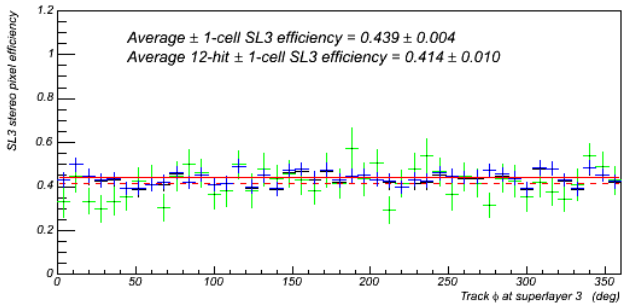
SL5

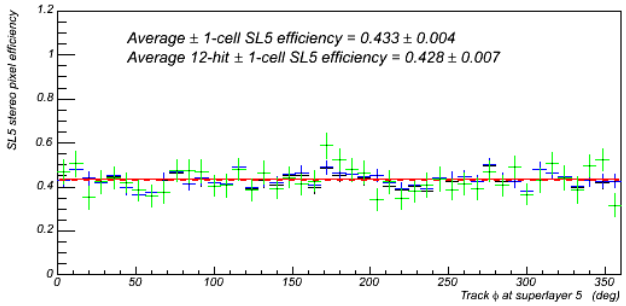


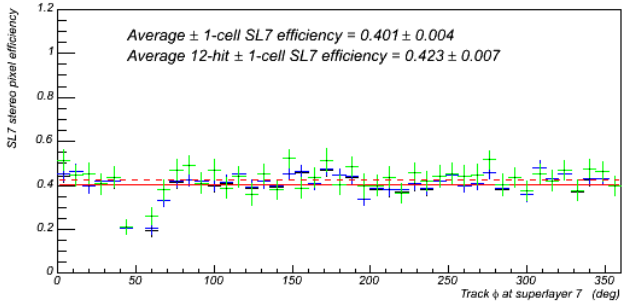
SL7

- No z-dependence.

Efficiency *vs* phi







- No real phi-structure
- Small hole near ϕ=50$^{\pm}$ in superlayer 7.

Conclusions?

- Quantitative efficiency estimates don’t seem consistent with visual impressions.
- Seems like a bug in the analysis somewhere.
- Next, look for where the closest pixel is actually found.
- Check this on individual events – compare with event display.