ePIC Progress Report

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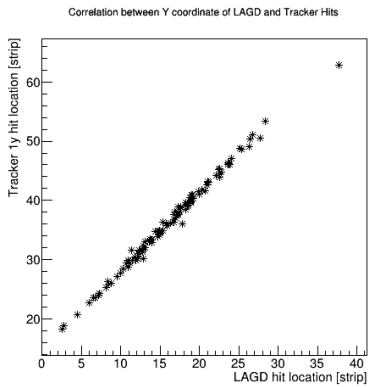
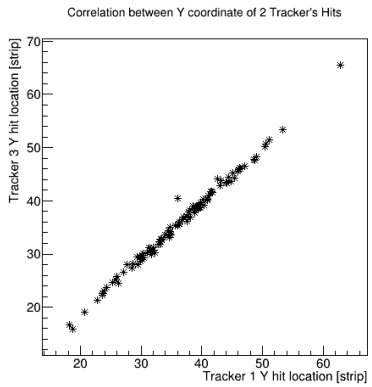
Updates on LAGD Resolution Studies

- Fixed Mapping problems in Amore
  - Combination of a few issues and misunderstandings
- Calculated potential final resolution plots

Lessons learned about Amore

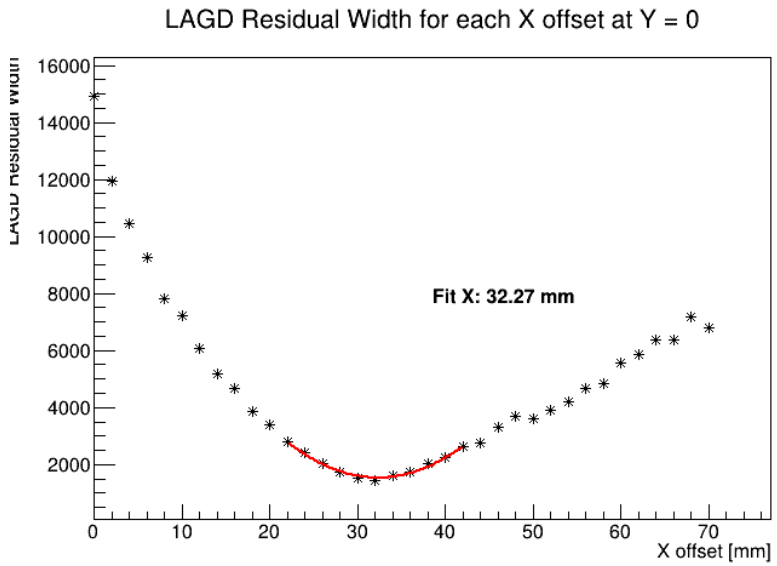
- Understanding the use of SRSMapping, SRSAPVEvent, and SRSHit
- Followed similar mapping scheme used for Trackers
  - Except for pin to strip mapping
- Ultimately the X and Y APVs were swapped in the config file, which led to strip correlation plots with no correlation





Better Xoffset Alignment

- Having issues with fit functions before
  - Applied parabola around the minimum data value ± 10 mm
  - much better results for X offset
- Makes both methods ive used agree, and makes M2 unecessary
- Tested my code with data from another hit location, gave expected result! :)



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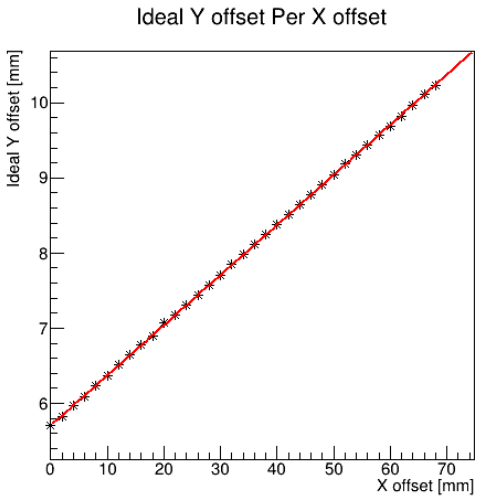
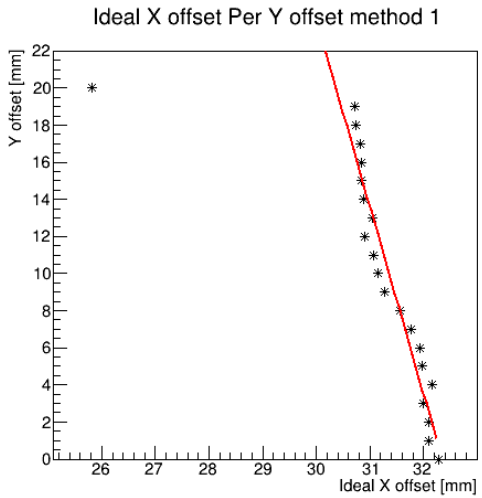
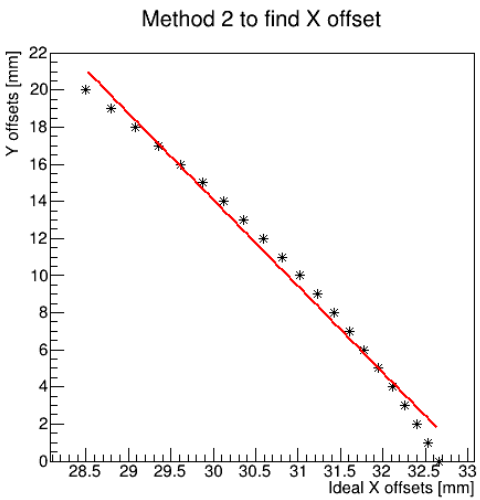
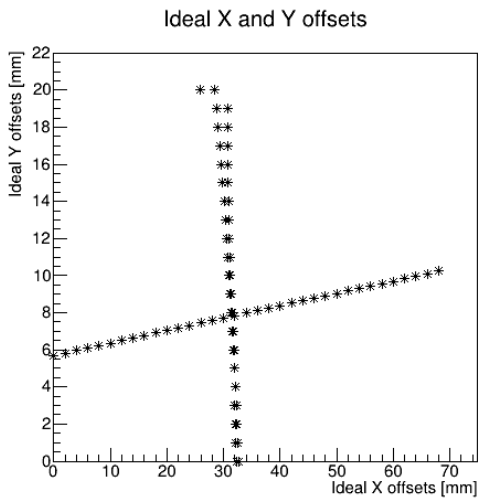
New Tracker Offset plots

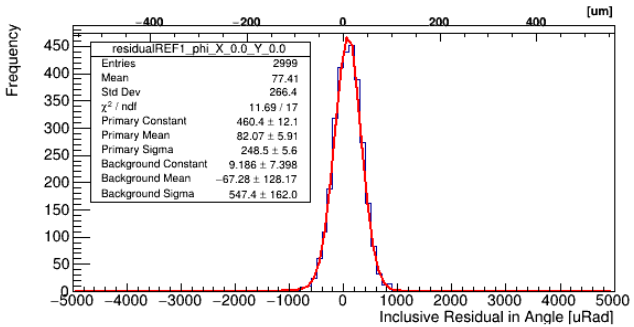


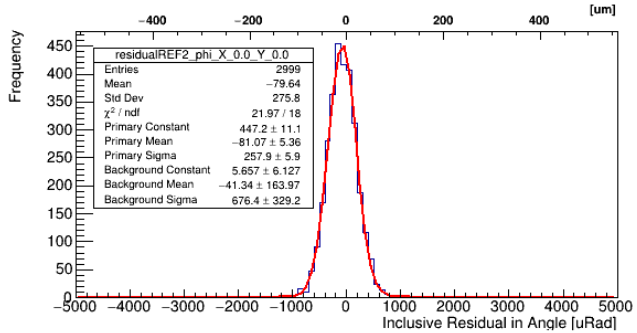


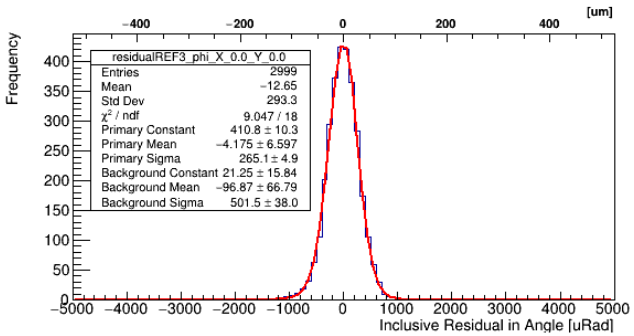


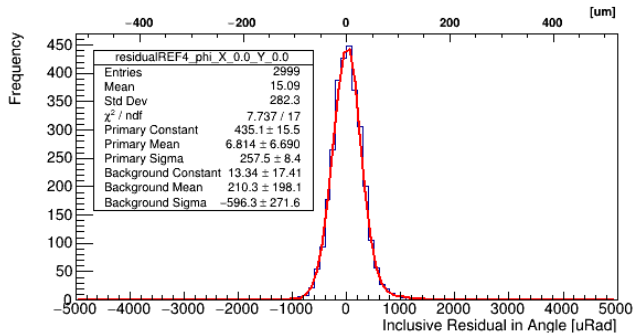


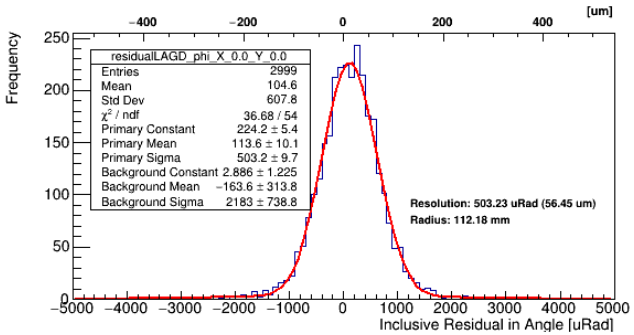
New LAGD and Tracker Angular Residual plots





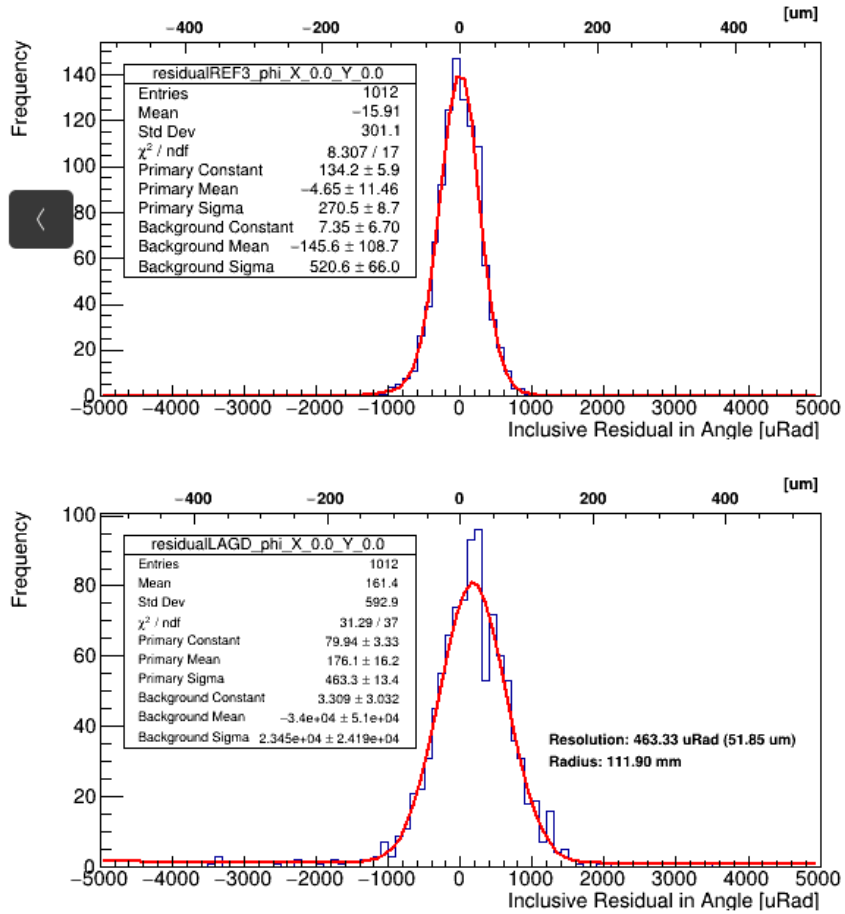






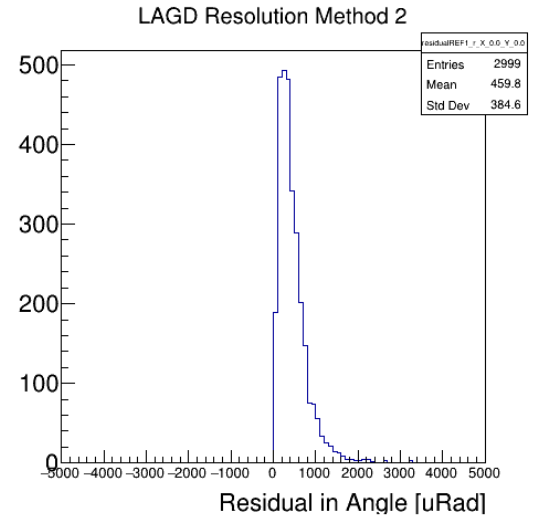
New residual plots

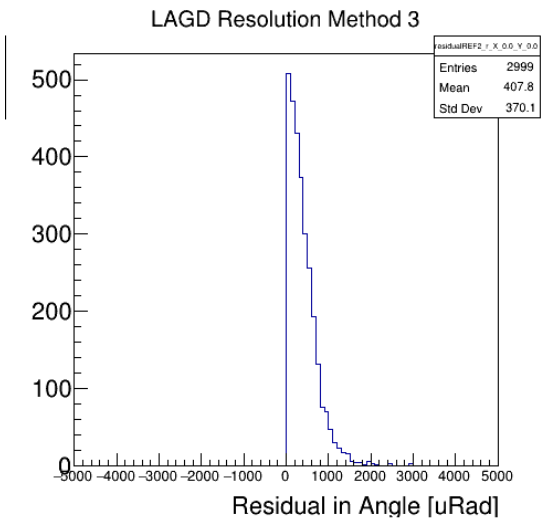
- New residual plots with new stats and axis
  - converted to uRad and um
  - All gaussian stats



Calculating Resolution

- Error from the data is combination of LAGD and Tracker intrinsic error add in quadrature
- $\text{res}_{M2} = \sqrt{|\sigma^2_{EXC} - \sigma^2_{Tracker}|}$
  - or $\text{res}_{M3} = \sqrt{\sigma_{EXC} * \sigma_{INC}}$
- Tried hisotgramming indivdual resolutions for easier stats determination
- M2 gives 460.2 uRad $\pm$ 7.0 uRad
- M3 gives 407.8 uRad $\pm$ 6.8 uRad





Calculating Tracker Resolution

- Using Method 2, I wrote a code to determine the Resolutions for the Trackers
- Iterates theough each tracker and finds σ_{Exc} and σ_{Track}
- All Trackers around 50 um as expected