BERKELEY LAB
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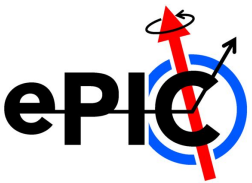
U.S. DEPARTMENT OF ENERGY
Office of Science

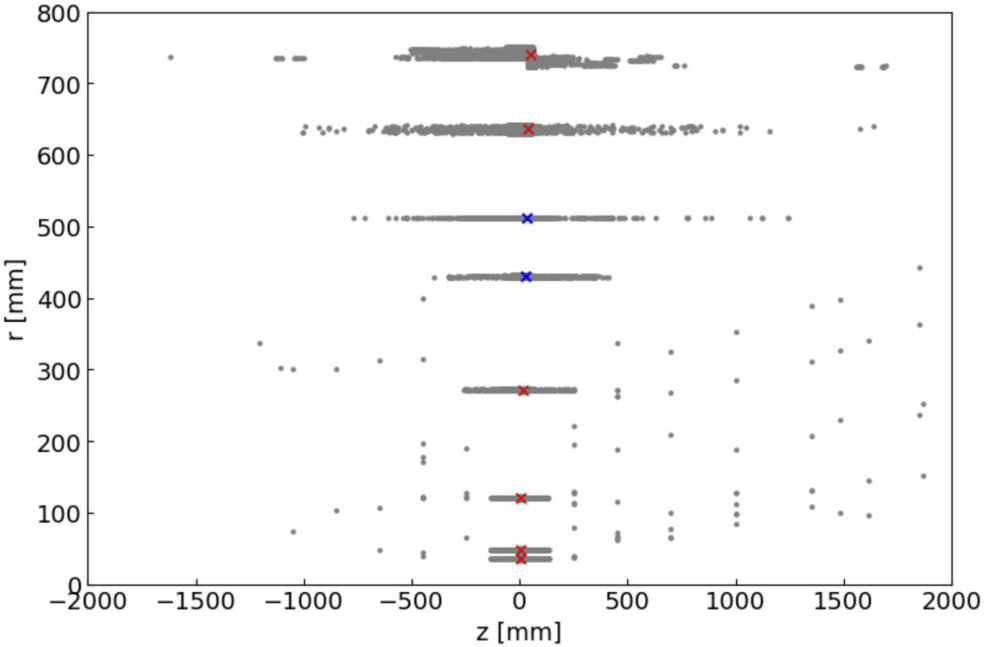
Chi2 Cut in ACTS

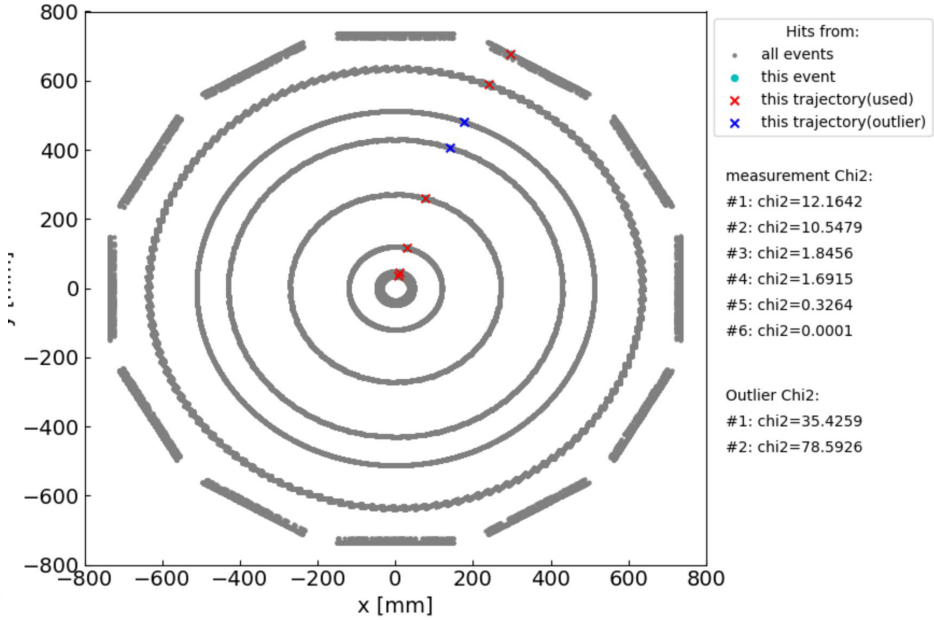
Shujie Li

LBL EIC meeting
Mar 12, 2024



Outliers in Track Reconstruction

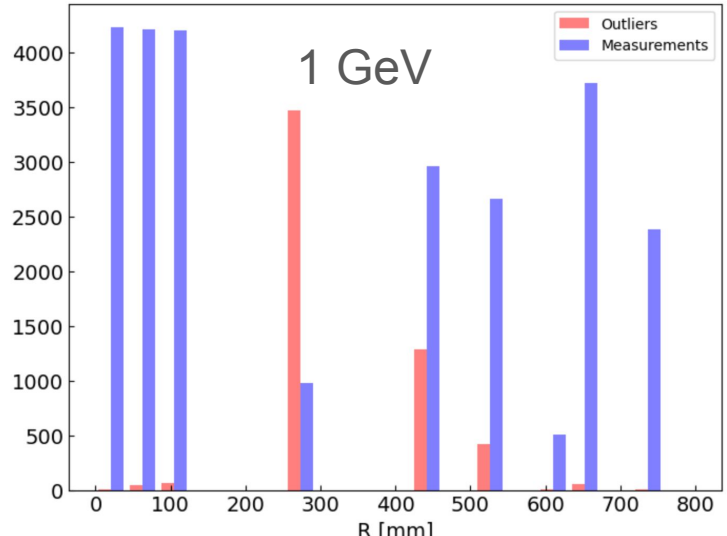


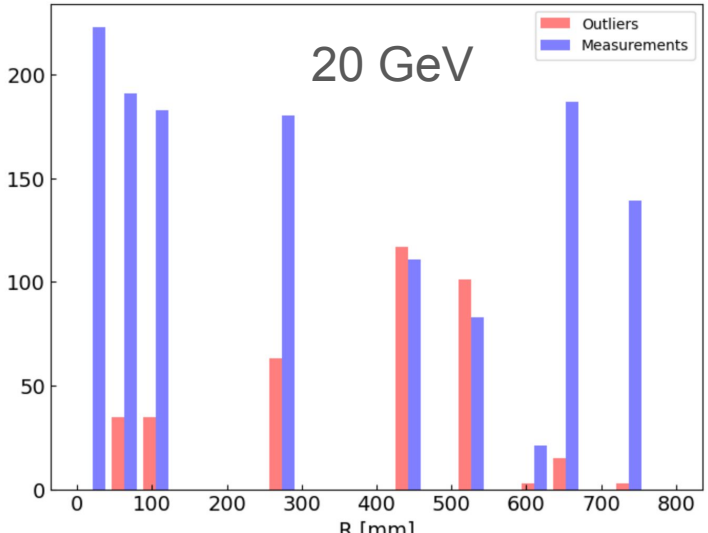


Outliers Distribution

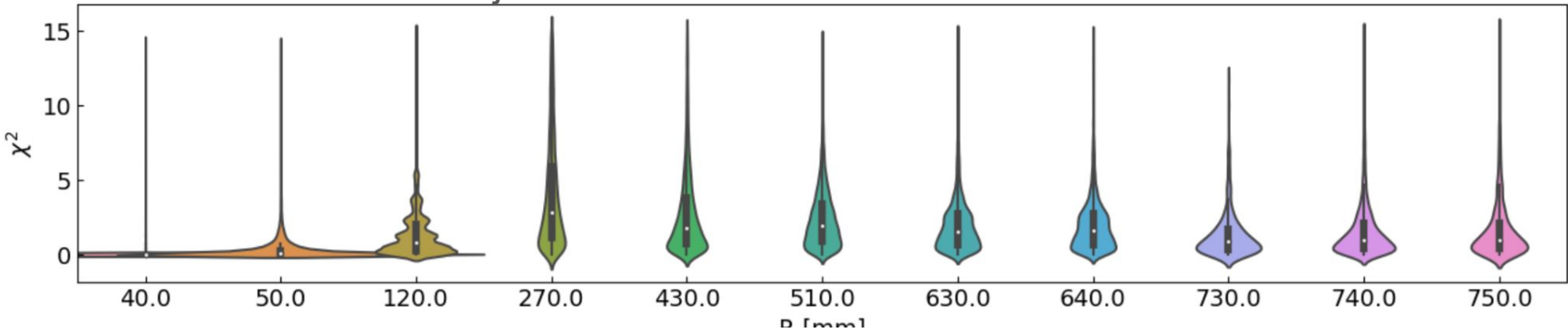
- Event samples:
  - single mu-, real seed, eta → 0 (generated by Beatrice)
- Events with outliers:
  - 1/5/10/20 GeV: 1400/200/100/70

- For tracks with outliers, plot Measurements/Outliers v.s. R

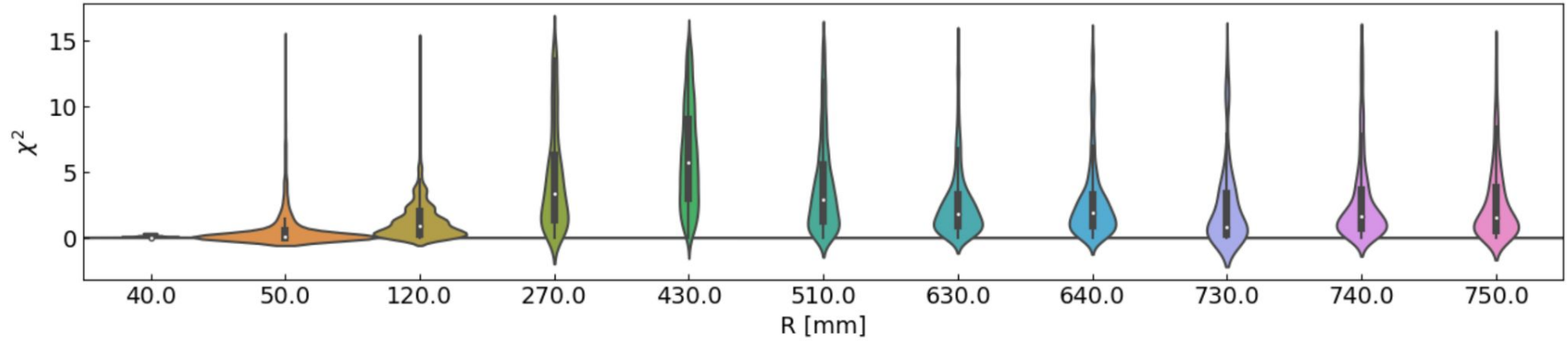




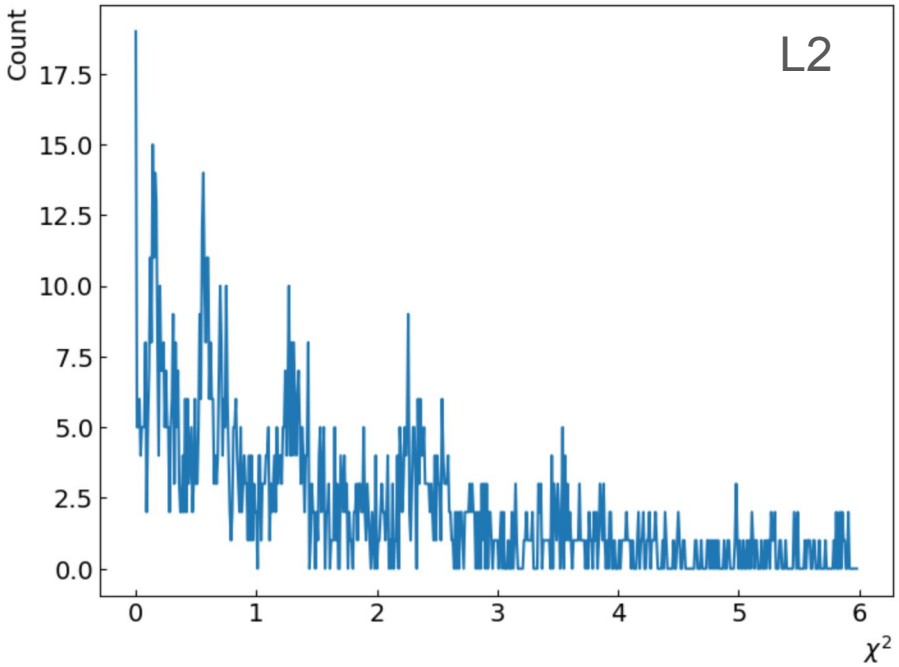
measurements from traj w/o outliers

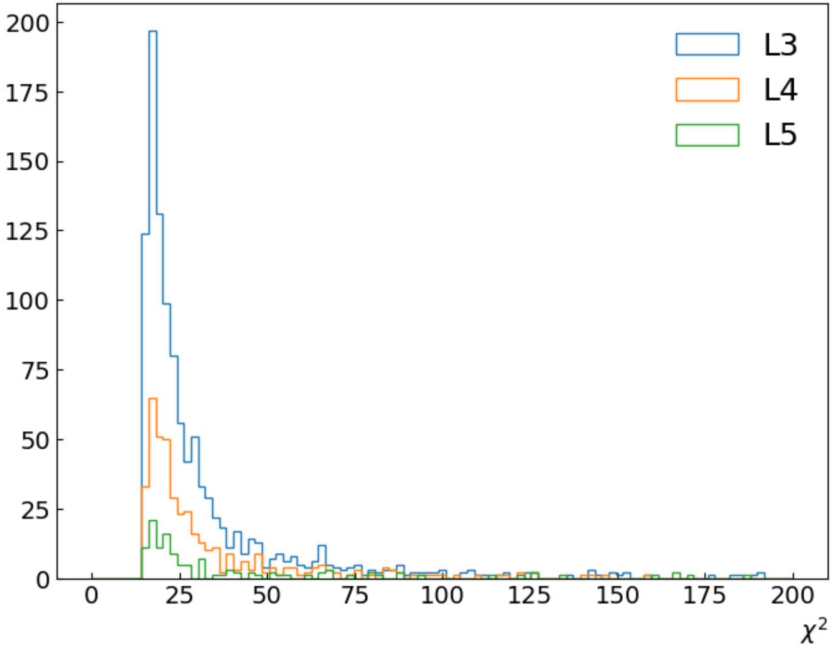


measurements from traj w outliers



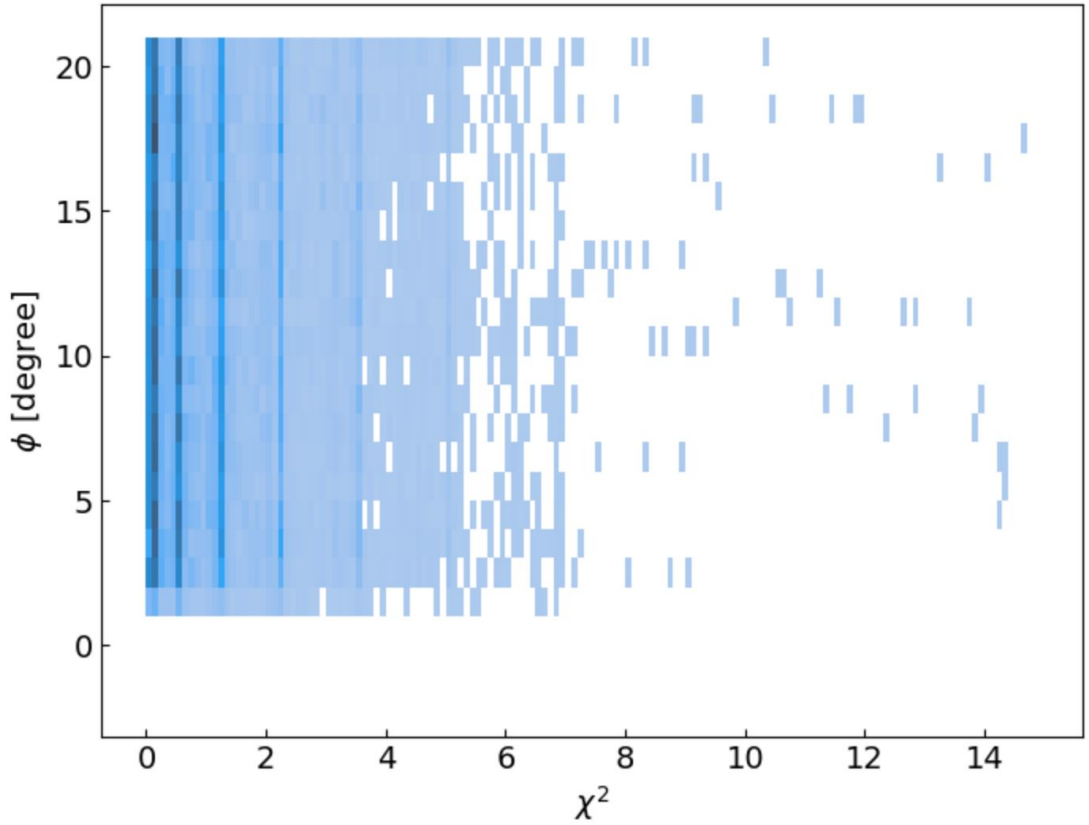
Chi2 from outliers





To do: increase chi2 cut from 15 to 50, and check track performance esp. with DIS+background

Chi2 vs phi



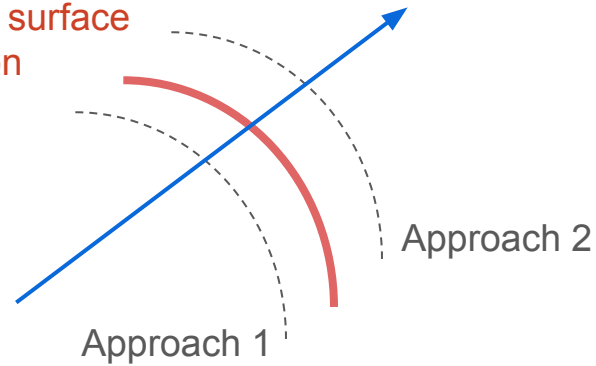
Pointing study on L2

Use a “Pointing” sample:

- 1 GeV, very narrow theta and phi range to check
- **chi2**
- **predicted** track position with track segment

Representing surface (Approach 0)

- Sensitive surface
- digitization



Approach 1

- Virtual surface
- Material mapping

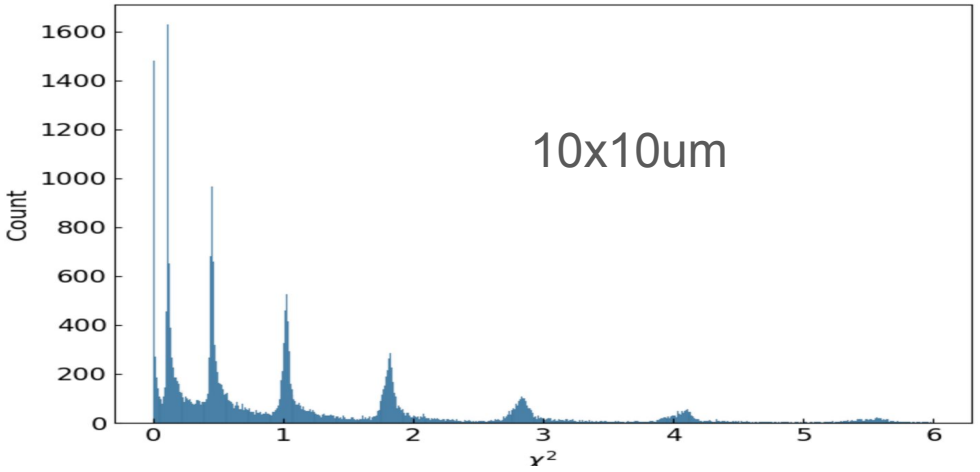
Track projection:

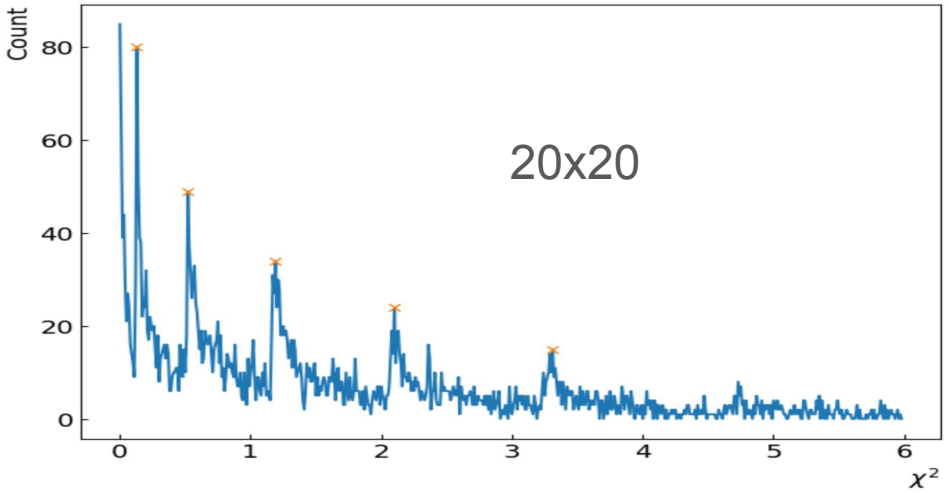
- predicted: based on track para from track finding
- smoothed: based on the final smoothed track after track recon

Chi2:

Calculated at the track finding stage to select measurements.

Chi2 v.s. Pixel size





Projected z and theta per surface