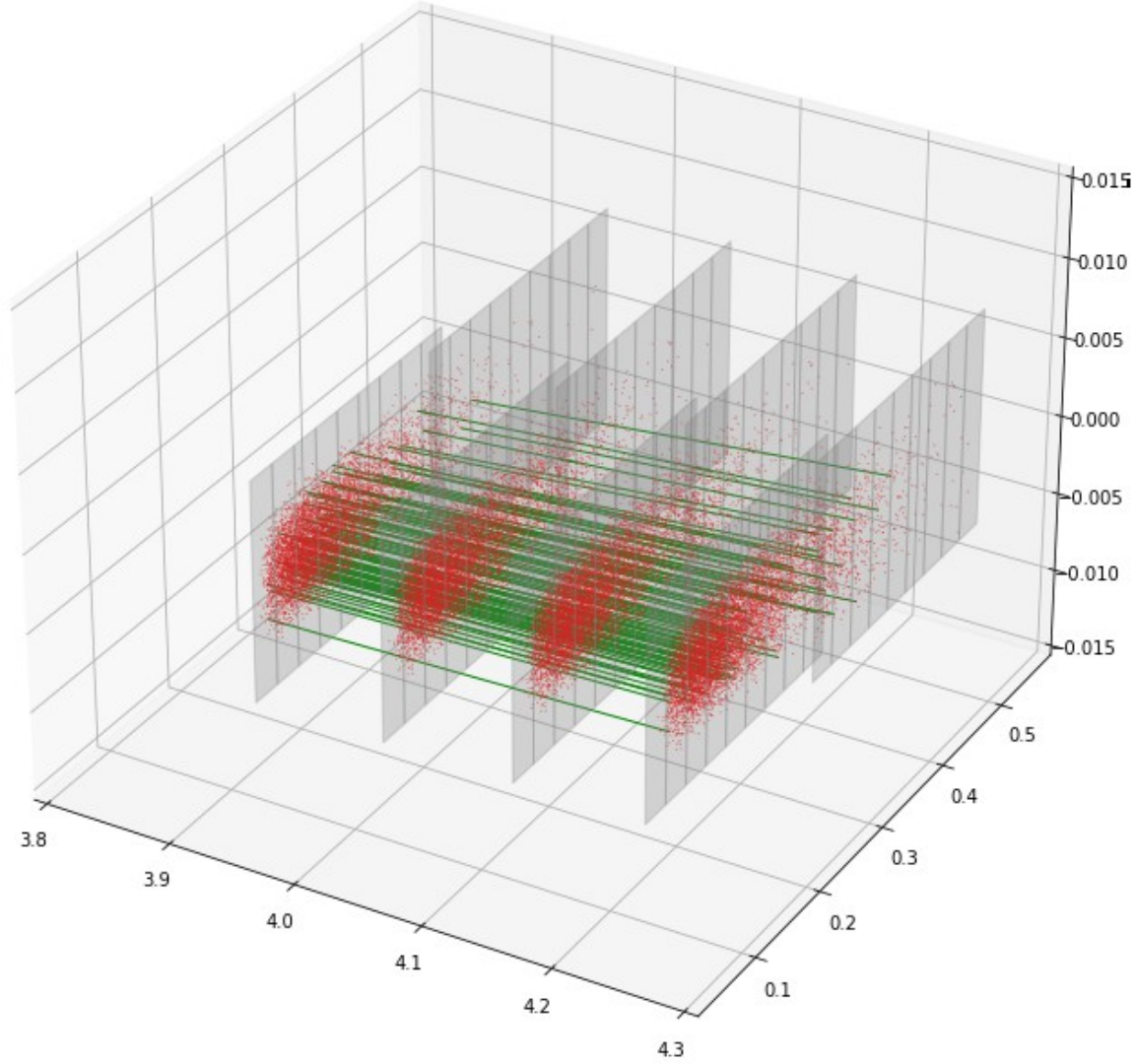
LUXE Toy Experiment

Simplified/Full LUXE(-like) configuration to study detector acceptance



Toy LUXE overview

Configurations

- Full results in /nfs/dust/user/spatarod/ToySimulationResults/
  - plots, histograms, ...
- Input files are taken from ptarmigan v0.8.1
  - brem-laser: xi = 5
  - e-laser: xi = 3
- B = 1.0T, 1.25T, 1.5T for both simplified and full detector setup
- Simple setup: only four detector planes, no gaps
- Full setup: 72 chips, 9 chips * 8 staves with gaps

Toy LUXE Results brem-laser

Results Simple Setup

- 7039 entries in ptarmigan file, sum(weights) = 1.3785
- weighted entries/BX not hitting ANY plane
  - B = 1.0 T: 0.0008 +/- 0.0004 (low energy entries and high energy entries)
  - B = 1.25 T : 0.0014 +/- 0.0005 (only low energy entries)
  - B = 1.5 T: 0.0014 +/- 0.0005 (only low energy entries)

Toy LUXE Results brem-laser

Results Full Setup

- 7039 entries in ptarmigan file, sum(weights) = 1.3785
- weighted entries/BX not hitting AT LEAST ONE plane (gaps between chips!):
  - B = 1.0 T: 0.0302 +/- 0.0024 (no specific energy scheme)
  - B = 1.25 T : 0.0264 +/- 0.0023 (no specific energy scheme)
  - B = 1.5 T: 0.0317 +/- 0.0025 (no specific energy scheme)
- weighted entries/BX not hitting ANY plane:
  - B = 1.0 T: 0.0002 +/- 0.0002 (low energy)
  - B = 1.25 T : 0.0004 +/- 0.0003 (low energy)
  - B = 1.5 T: 0.0018 +/- 0.0006 (low energy)

Toy LUXE Results e^--laser

Results Simple Setup

- 6820 entries in ptarmigan file, sum(weights) = 139.8763
- weighted entries/BX not hitting ANY plane
  - B = 1.0 T: No escaped hits
  - B = 1.25 T : 0.1308 +/- 0.0544 (only low energy entries)
  - B = 1.5 T: 0.7155 +/- 0.1102 (only low energy entries)

Toy LUXE Results e^--laser

Results Full Setup

- 6820 entries in ptarmigan file, sum(weights) = 139.8763
- weighted entries/BX not hitting AT LEAST ONE plane (gaps between chips!):
  - B = 1.0 T: 2.9959 +/- 0.2988 (no specific energy scheme)
  - B = 1.25 T : 2.4793 +/- 0.2643 (no specific energy scheme)
  - B = 1.5 T: 2.9516 +/- 0.2699 (no specific energy scheme)
- weighted entries/BX not hitting ANY plane:
  - B = 1.0 T: No entries
  - B = 1.25 T : No entries
  - B = 1.5 T: 0.1159 +/- 0.0529 (low energy)

Summary

Conclusion

- For bot e^-- and brem-laser very few or even no escaping particles:
- e^-laser setup:
  - B = 1.5T: < 0.1% escaping particles (low energy particles)
  - no escapes for B = 1.0T, 1.25T
- brem-laser setup:
  - B = 1.5T: < 0.2% escaping particles (low energy particles)
  - B = 1.0T, 1.25T: < 0.1% escaping particles (low energy particles)
- Most escaping particles have very low energy