Tracking and reconstruction

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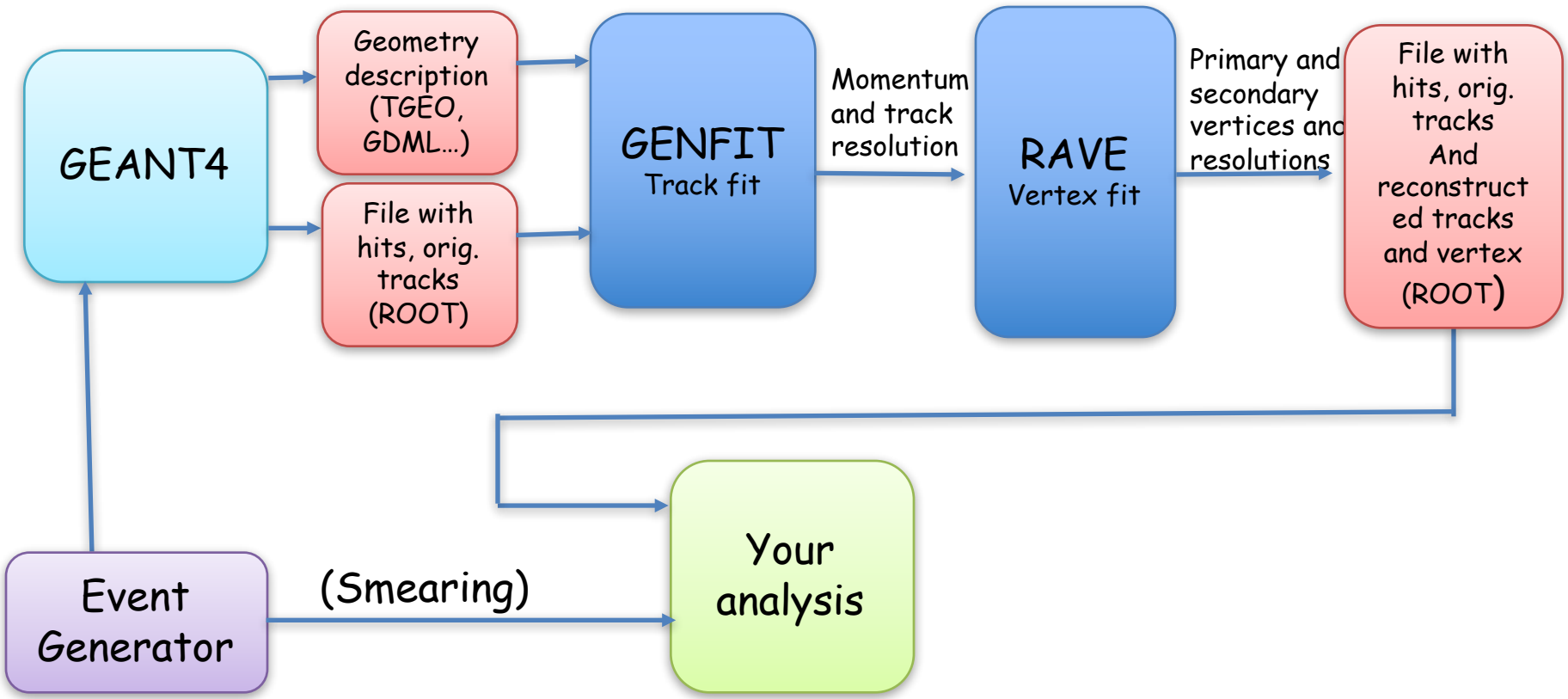
JSA
Jefferson Lab

MC SIMULATION AND RECONSTRUCTION



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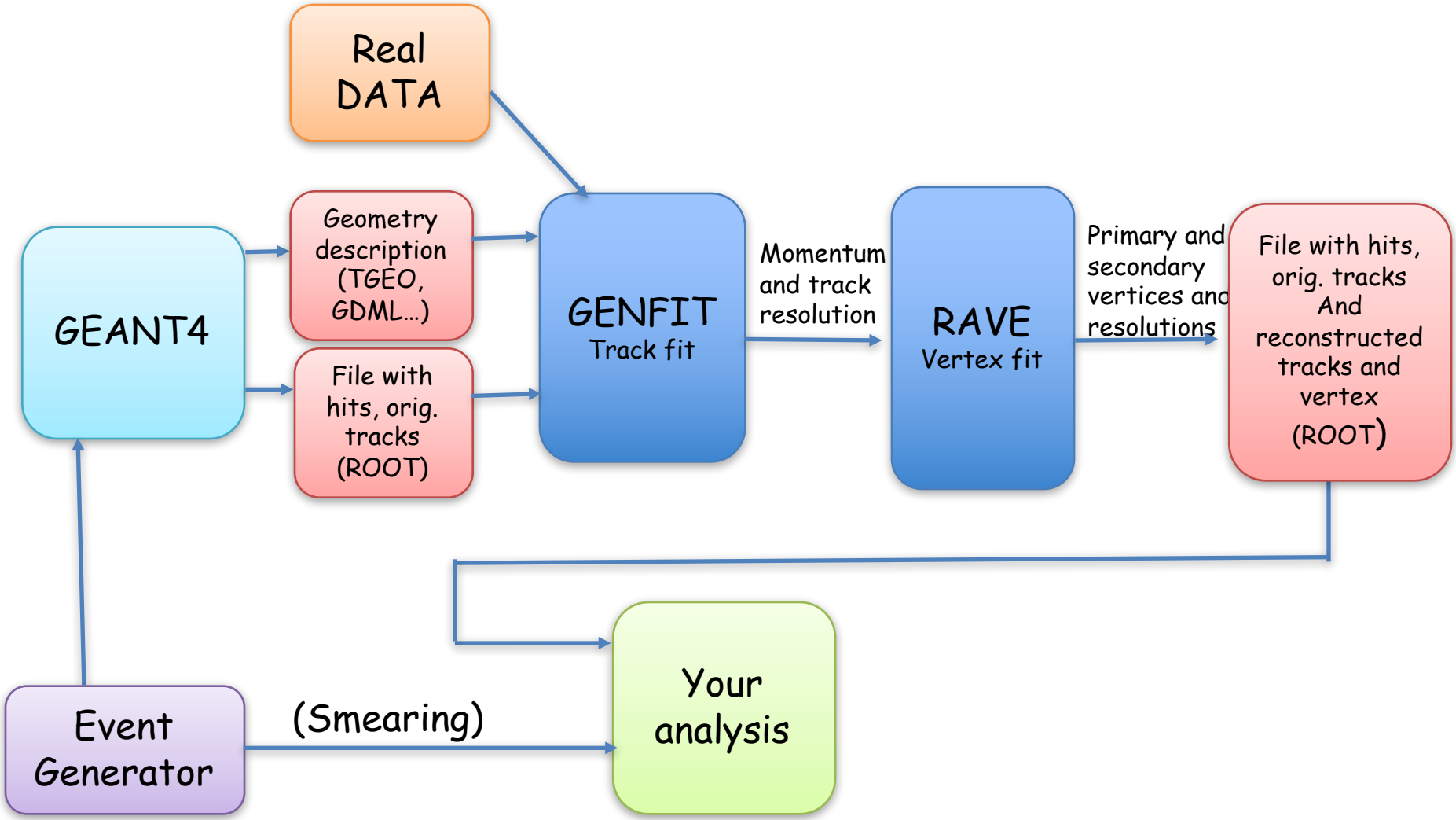
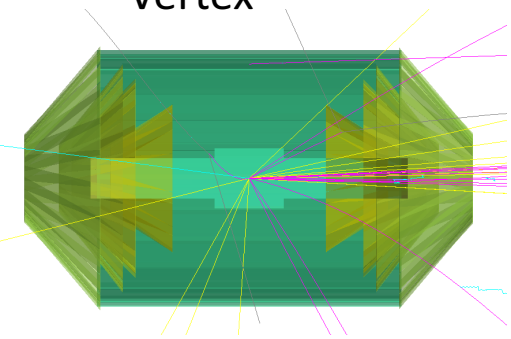
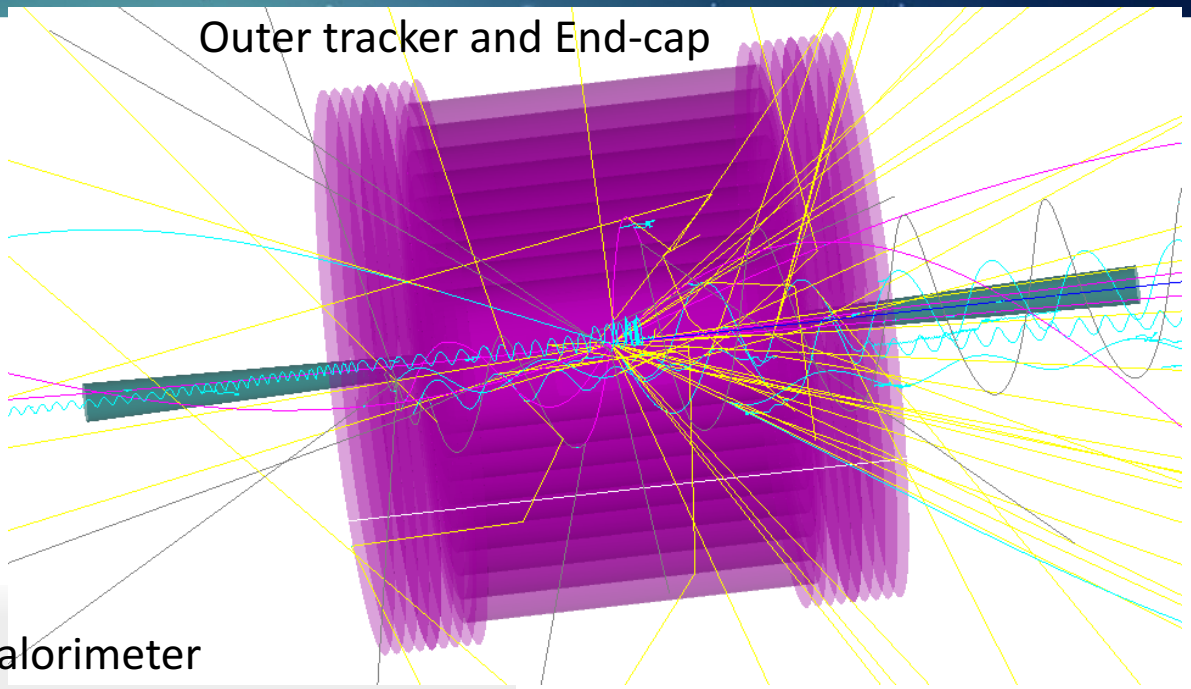


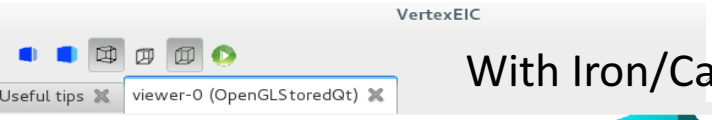
GEANT4

Vertex

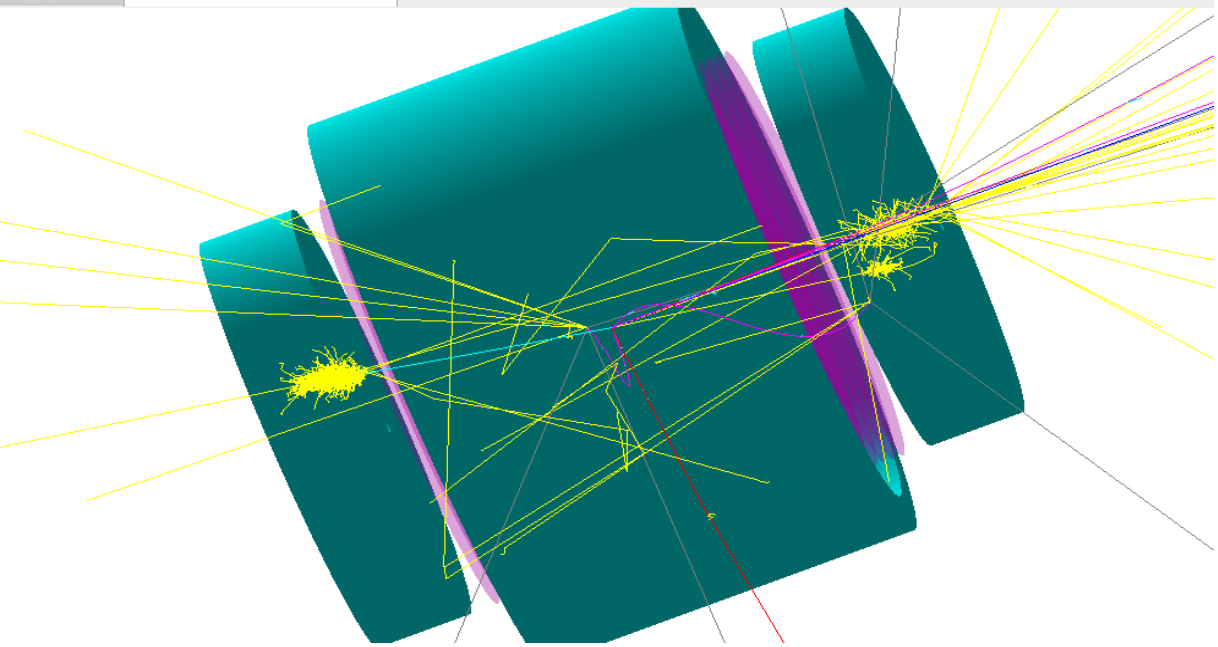


Outer tracker and End-cap





With Iron/Calorimeter



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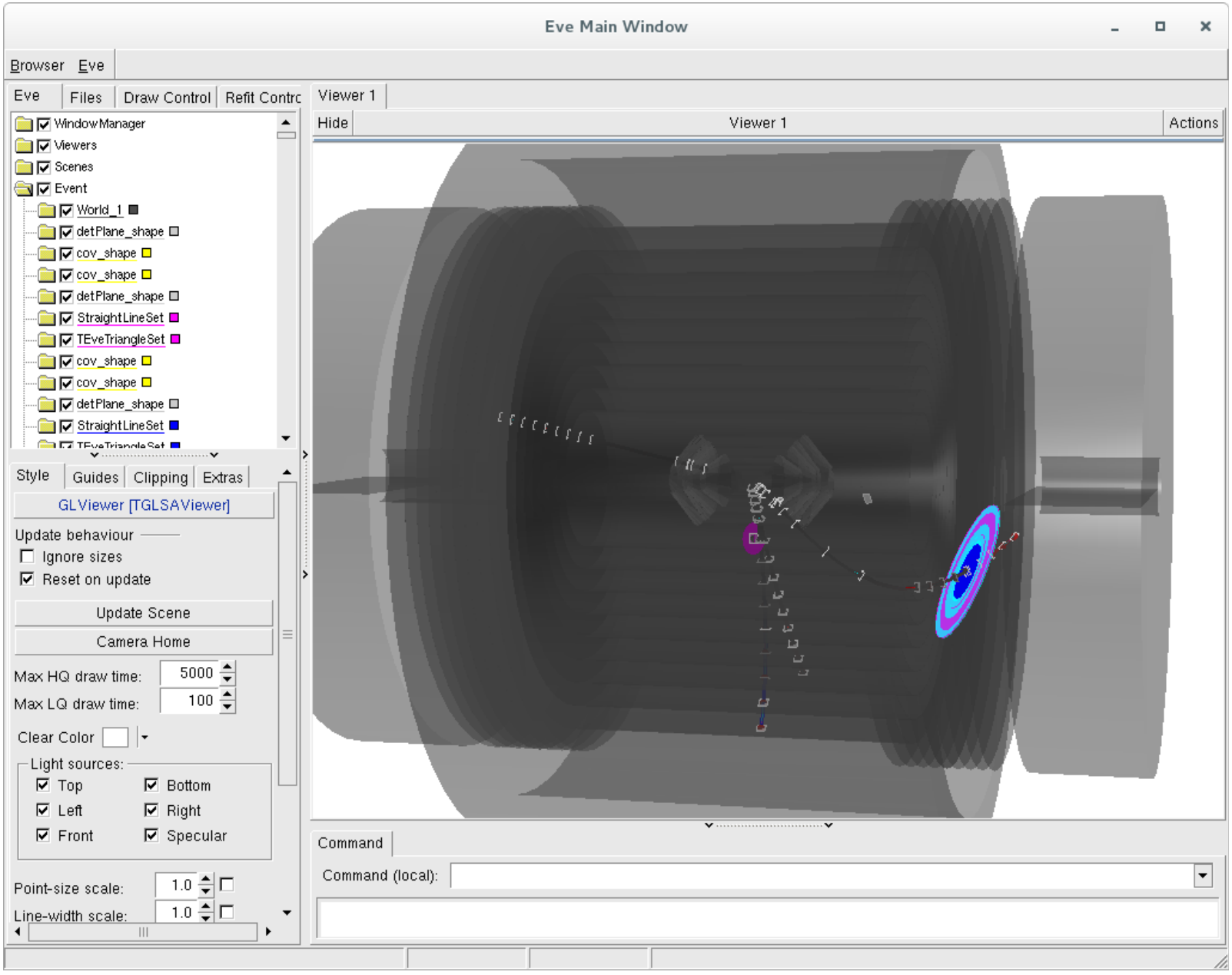
GENFIT/EVE EVENT DISPLAY



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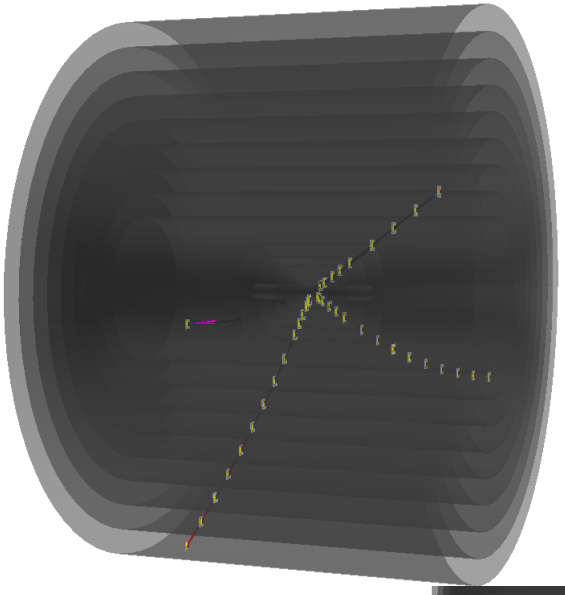

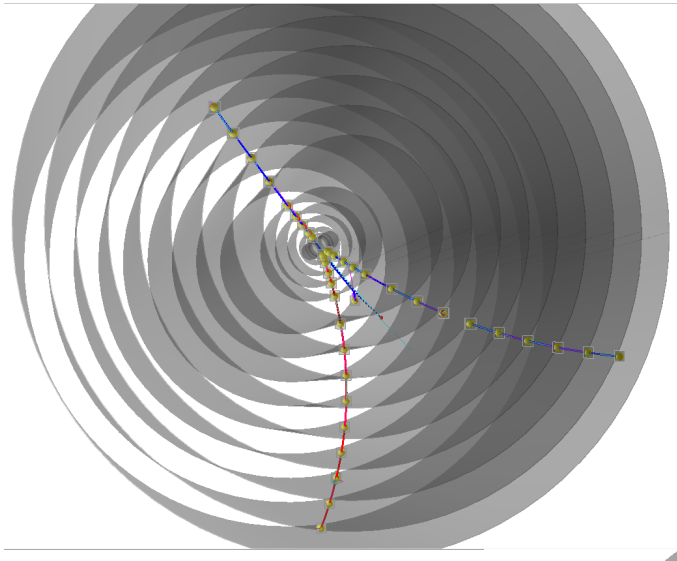

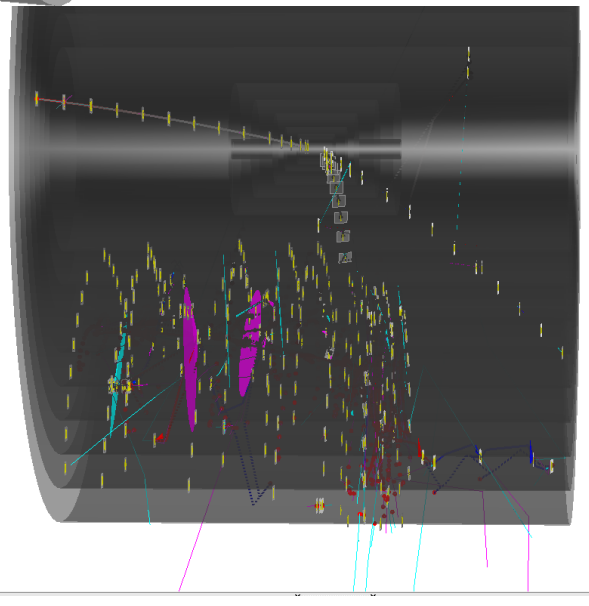

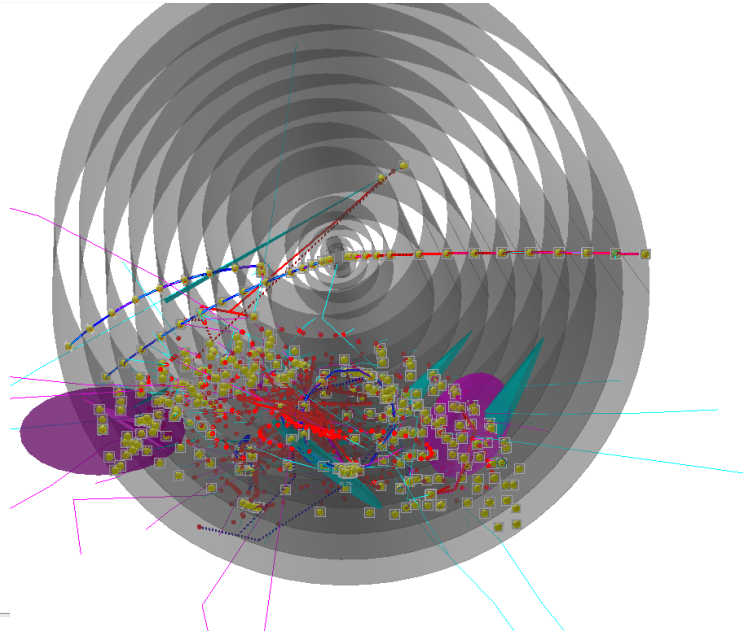

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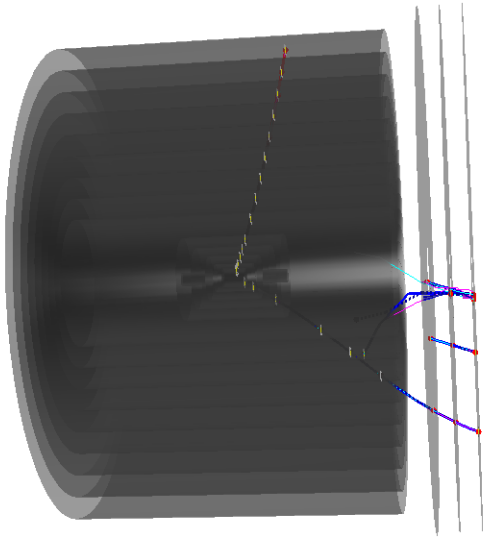

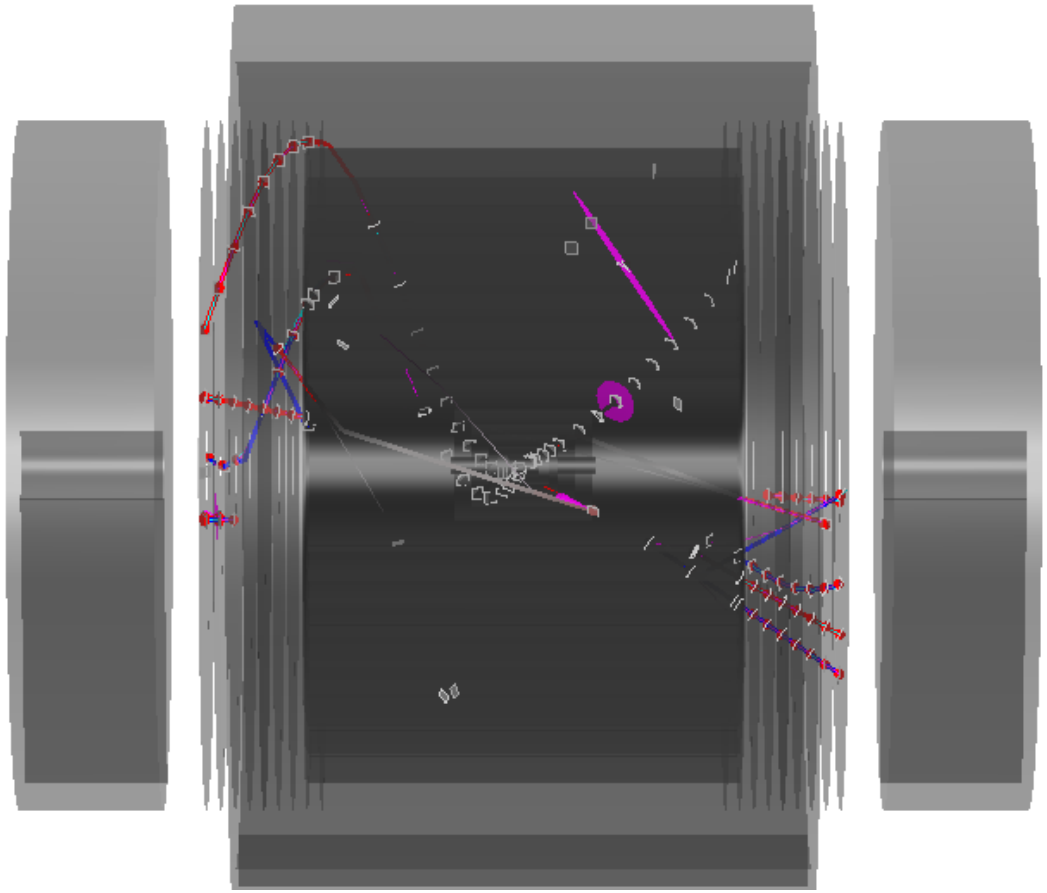

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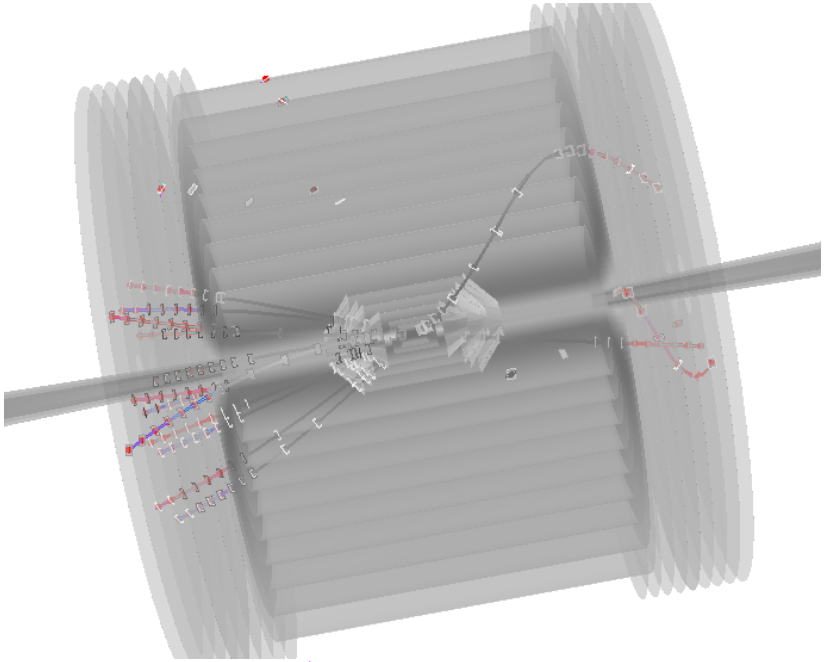
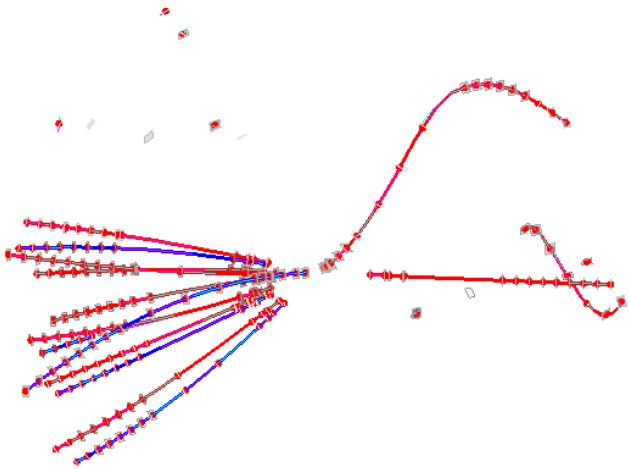
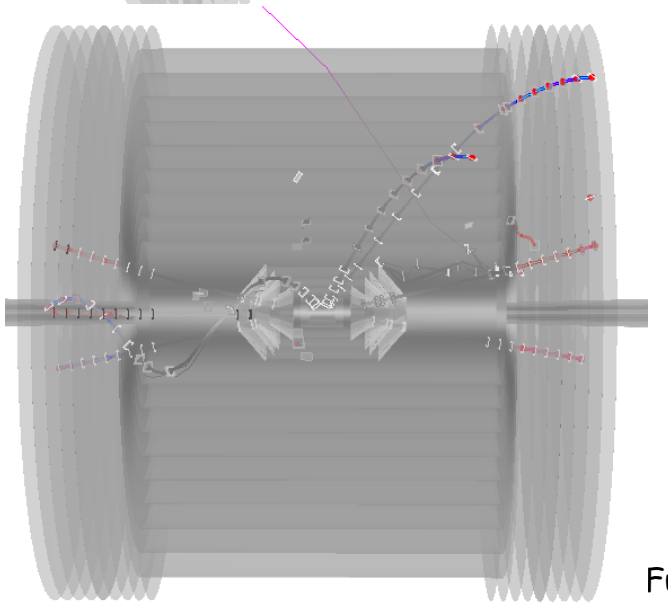
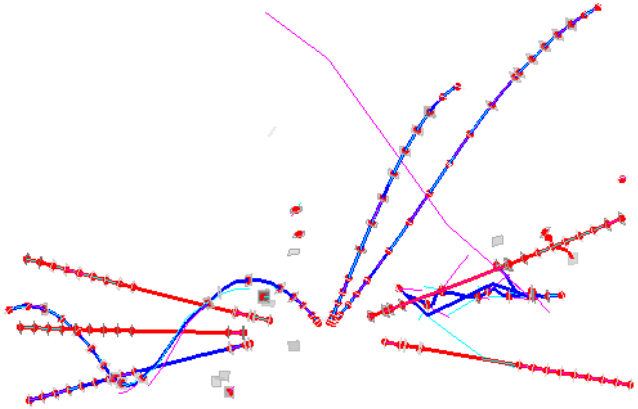


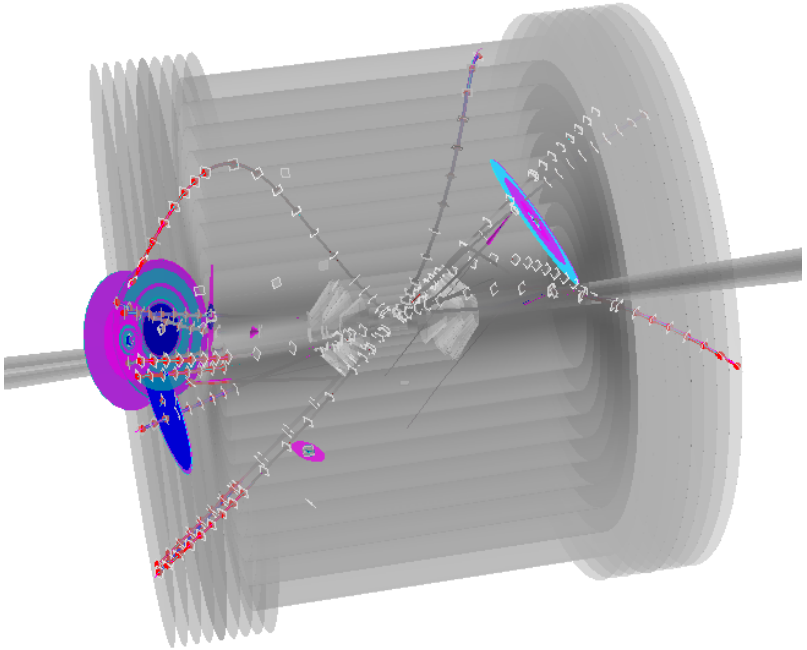


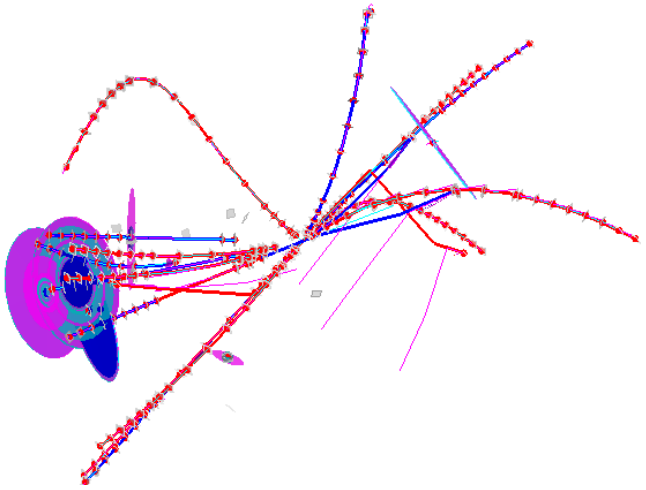


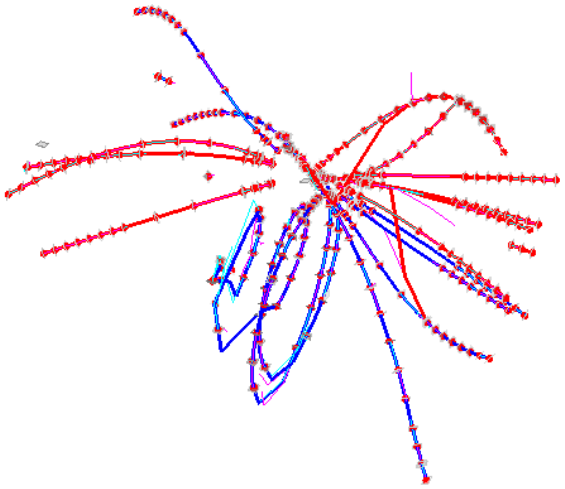


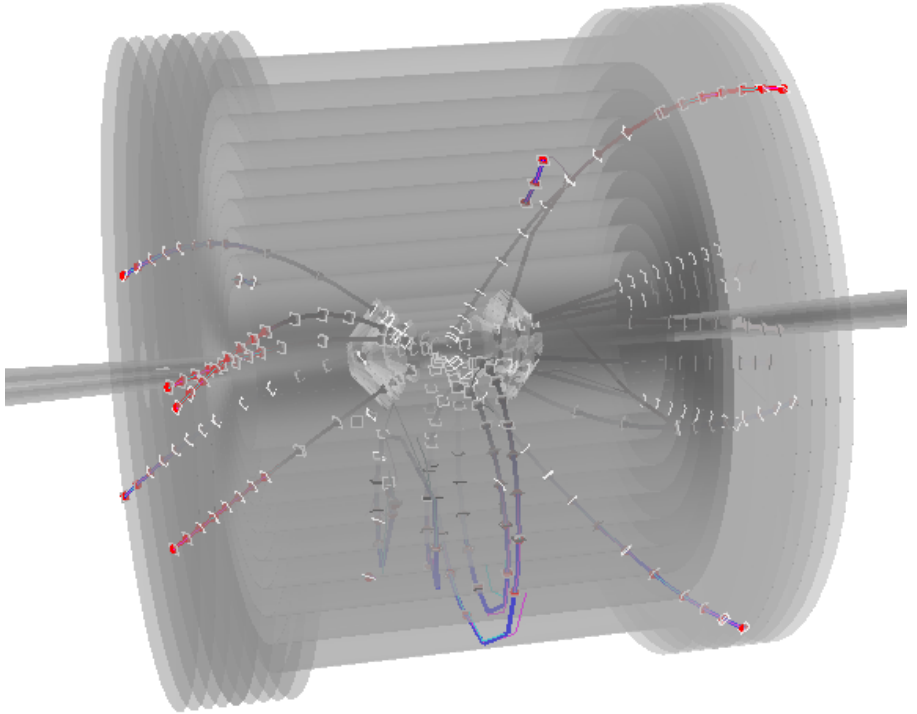
Furletova

GENFIT/EVE EVENT DISPLAY









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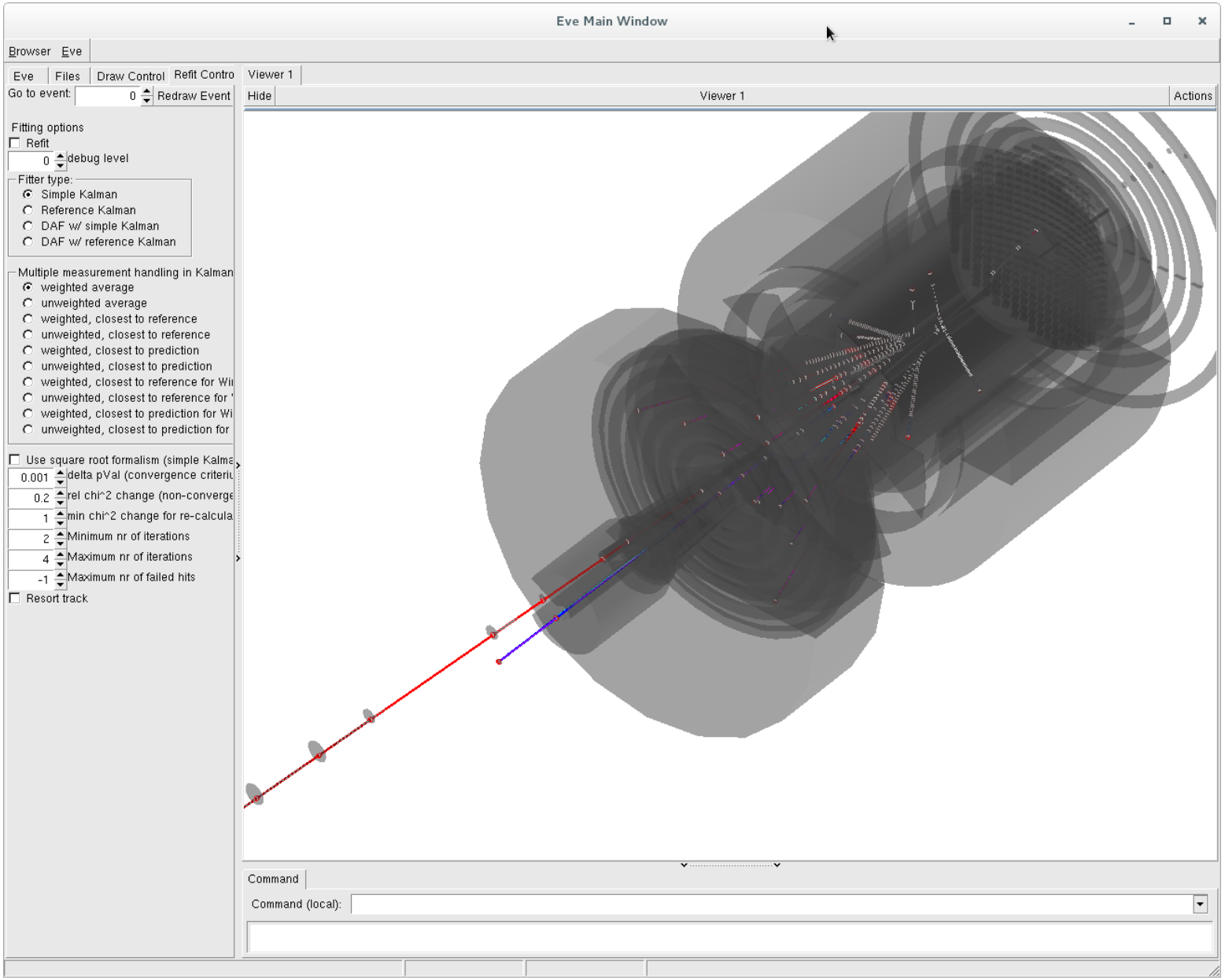
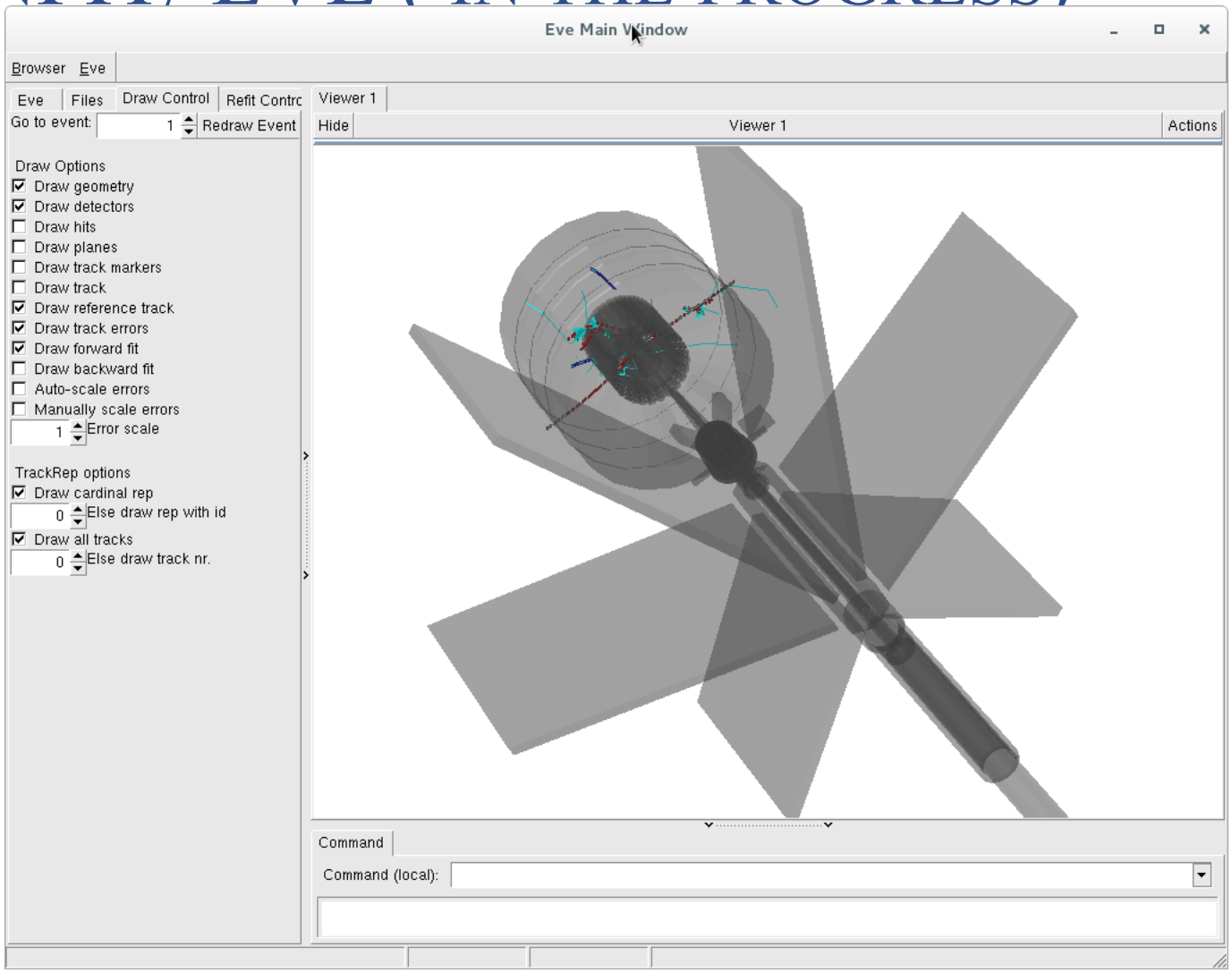
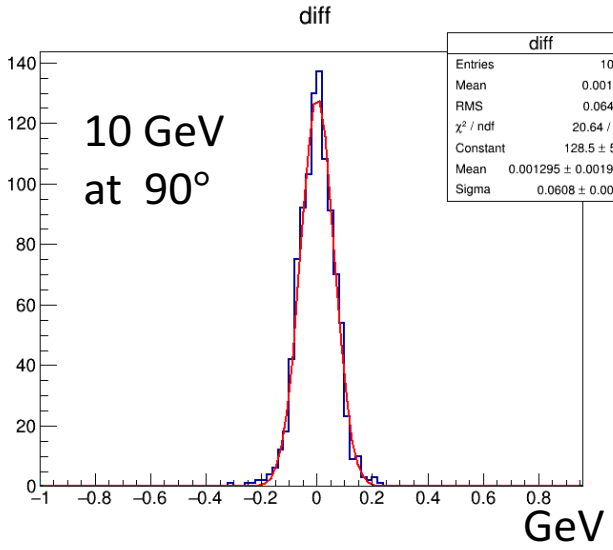
GEMC EIC HITS TO GENFIT/ EVE



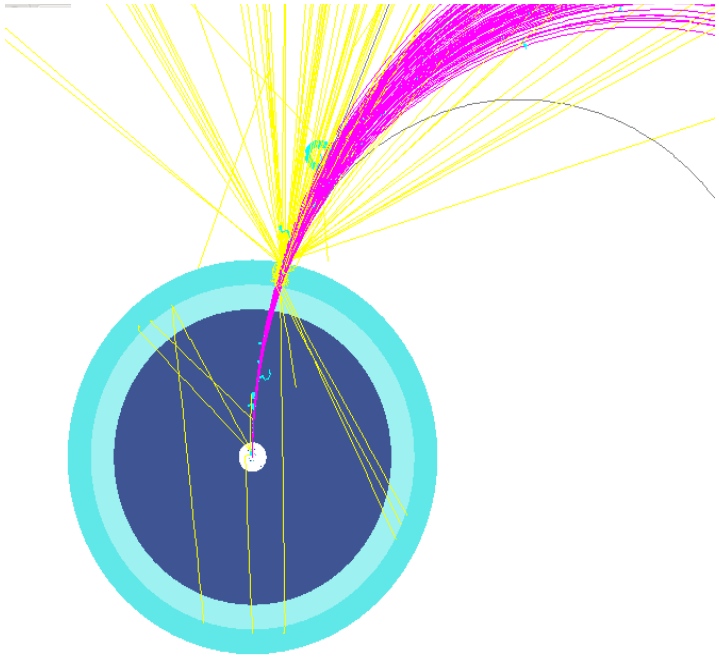
HALL-B GEOMETRY CONVERSION INTO GENFIT/ EVE (IN THE PROGRESS)

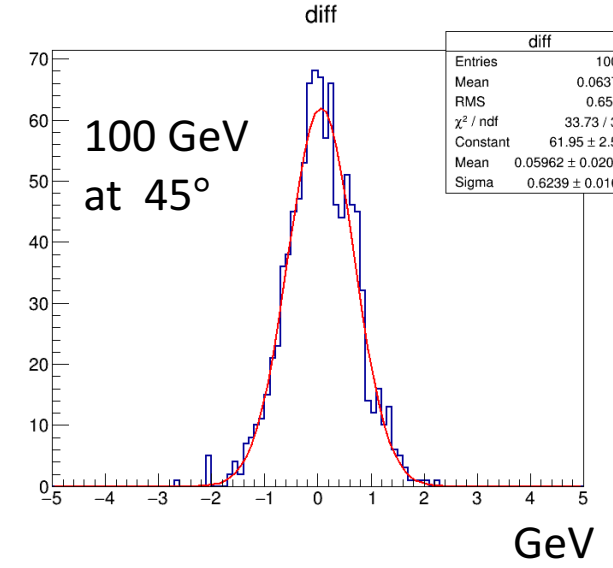


TRACKING PERFORMANCE

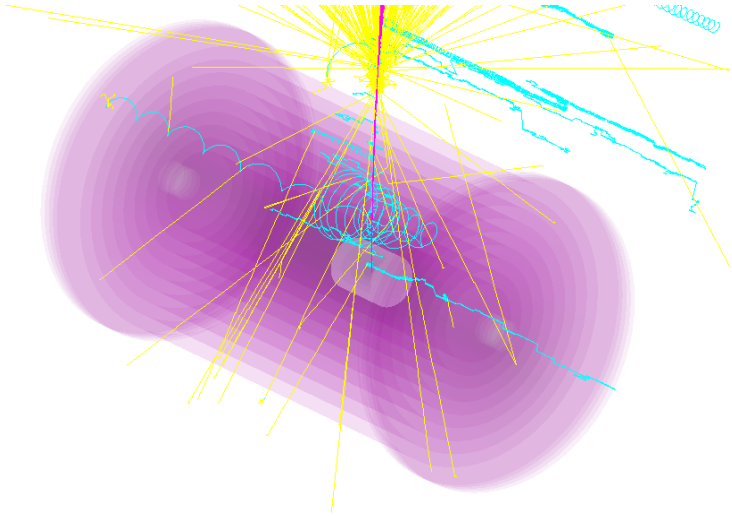


$$\frac{\Delta p}{p} = 0.0608/10 * 100$$
$$= 0.6\%$$



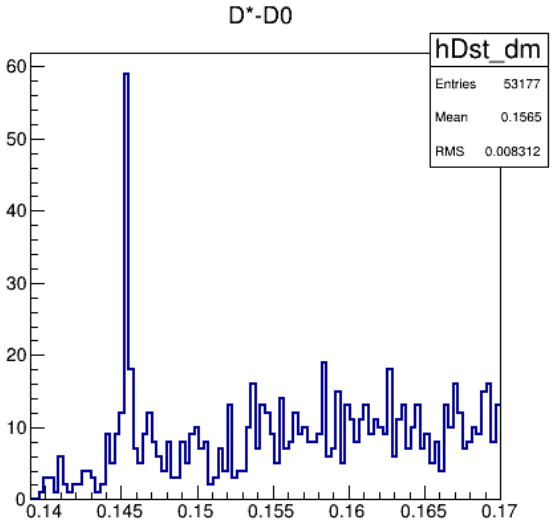


$$\frac{\Delta p}{p} = 0.632/100 * 100$$
$$= 0.632\%$$

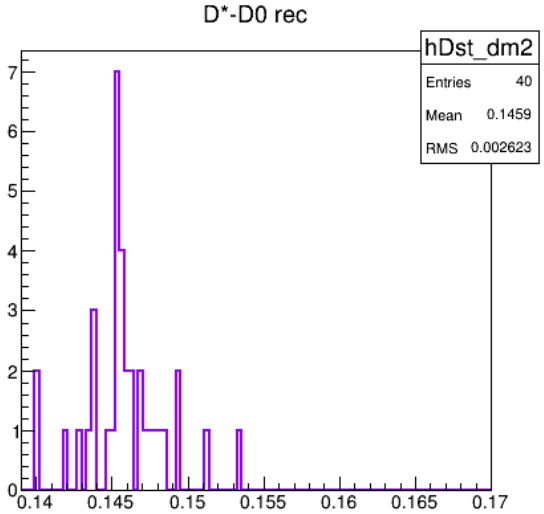


TRACKING PERFORMANCE

~60 D* events
with TRUE MC



~40 D* events
with rec. tracks



Main inefficiency is coming from reconstruction of π_slow with momentum <0.1-0.5 GeV

SUMMARY AND TODO:

- **GEANT4:**

✓ VERTEX det. is ready

✓ Outer tracker barrel, GEM-endcaps)

✓ Calorimeter

- **I/O file : Simple File Format (SFF) – ROOT based**
  - ✓ Hits
  - ✓ and MC info (org. momentum, id, etc.)
- **GENFIT** (track fitting)
  - ✓ is working well
  - ✓ ROOT based 'Eve' Event display
    - Event with multiple tracks
- **RAVE** (vertex fitting)
  - ✓ Software is installed, and link it with genfit.
  - ✓ Single vertex only (multi-vertexing – to be done)
- **Analysis:**

✓ SFF- I/O file with reconstructed mometa, vertex, PID , initial MC information.

- Run througth a full analysis

- **GEMC implementation: done**
- **JANA implementation: to be done**