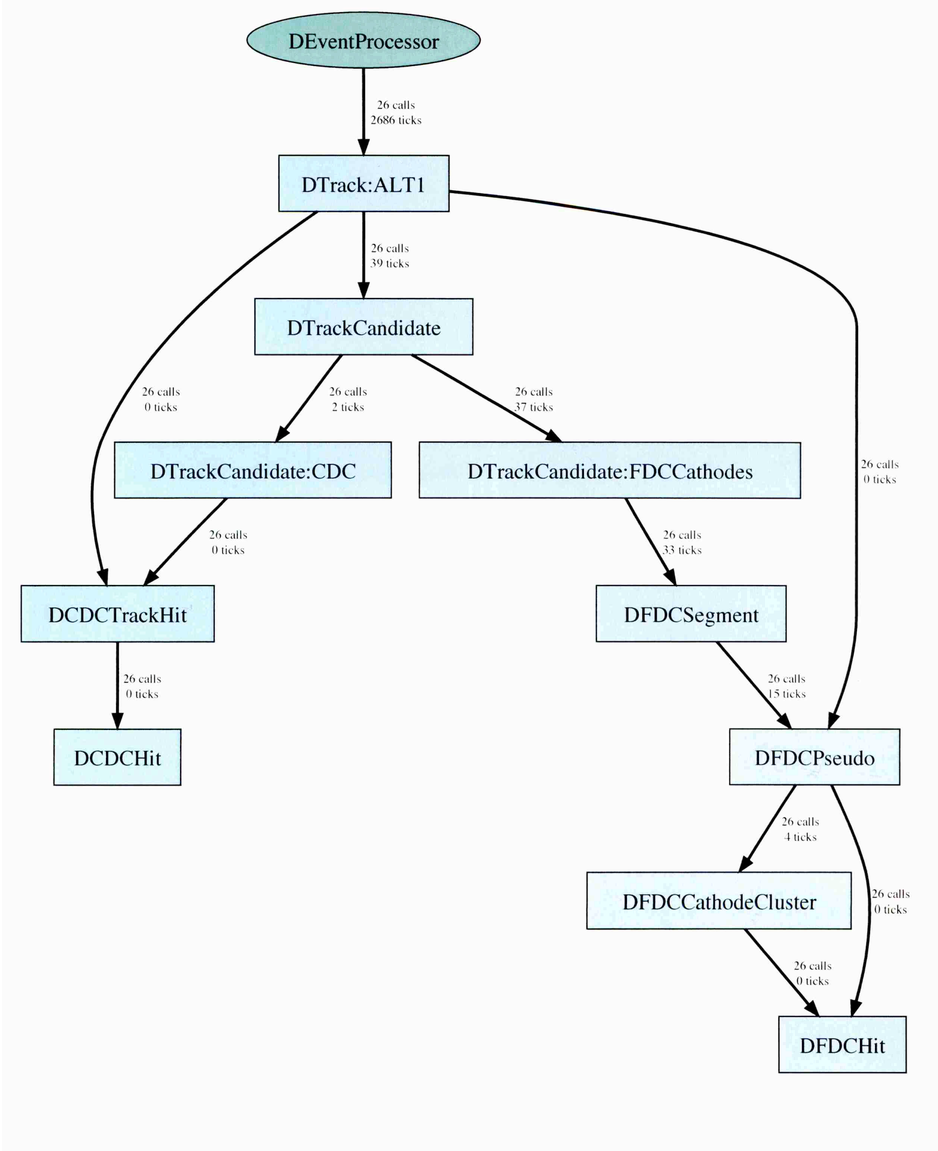
Highlights of Tracking Related Work Done Since March Tracking Review

May 16, 2008 David Lawrence

Modularization of Tracking Code

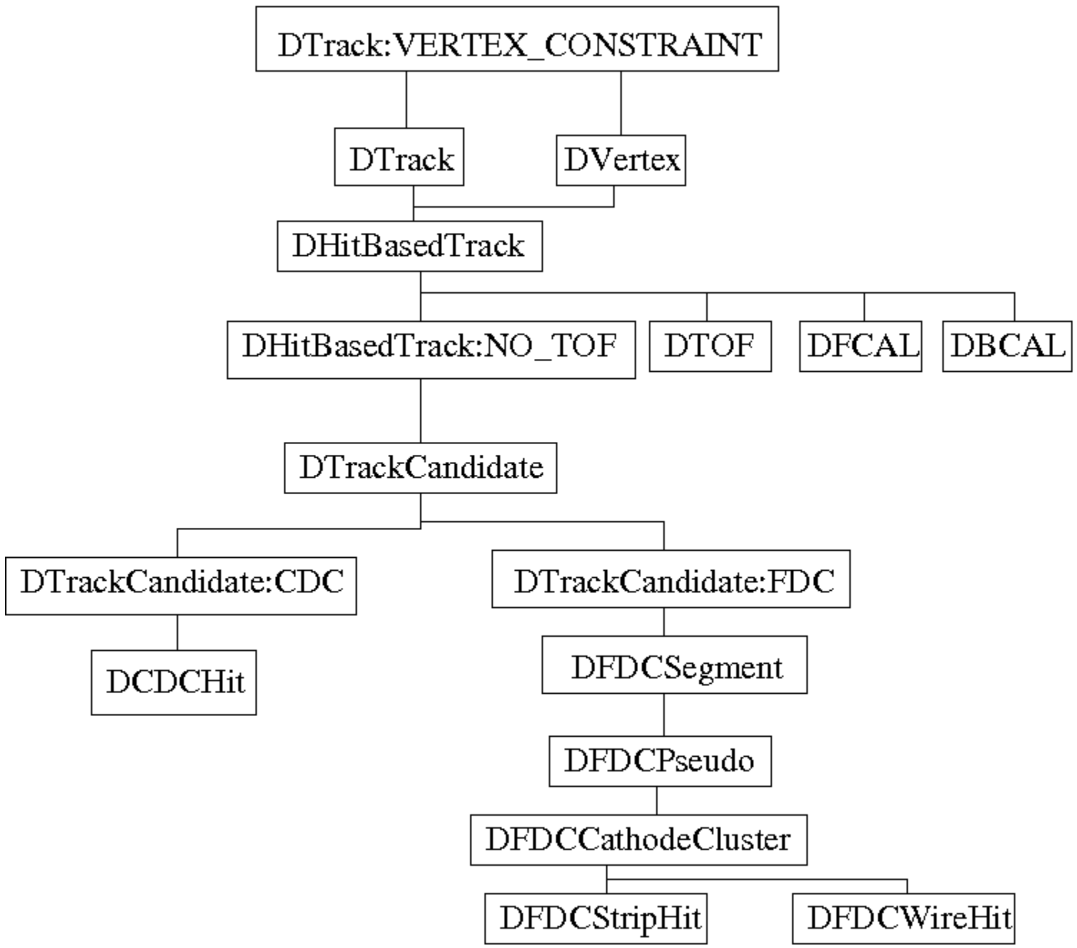


On April 4th Simon, Mark and Dave met to discuss how the information flow for track reconstruction could best be broken up into “factories”.

The diagram to the left shows the current state of the code as observed by JANA.

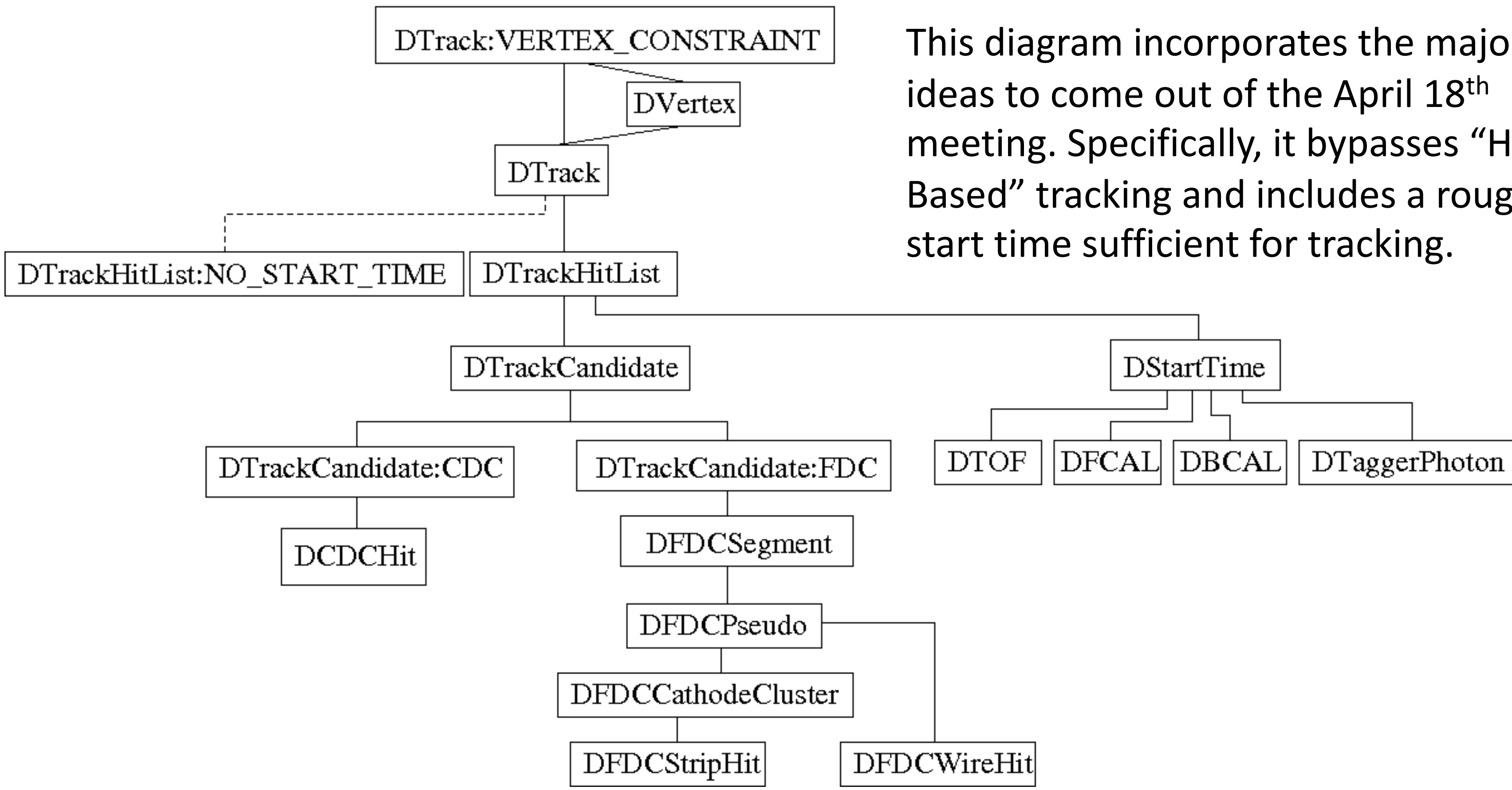
The main problem with the current design is that it does not allow a clean and obvious way to include the start time that will be needed before the final tracking (using drift times) can be done.

Modularization of Tracking Code cont.



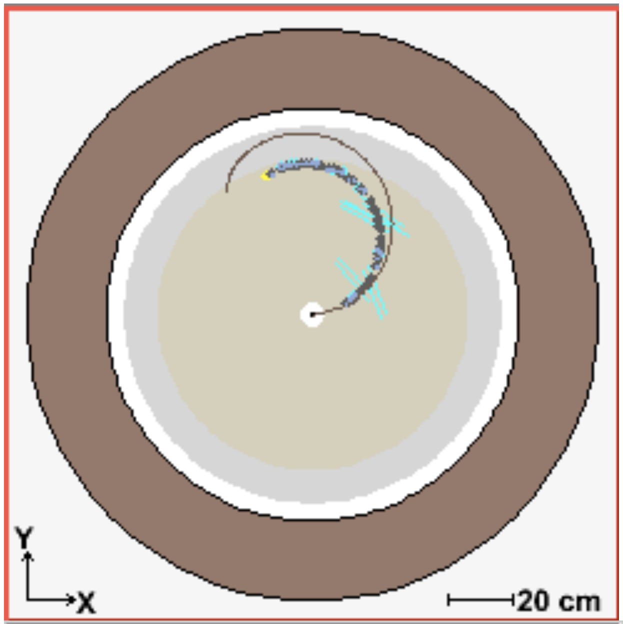
This diagram was presented by David as a starting point to the discussion. It was scribbled on a bit and at the end, several significant suggestions were made on how it might be improved….

Modularization of Tracking Code cont.

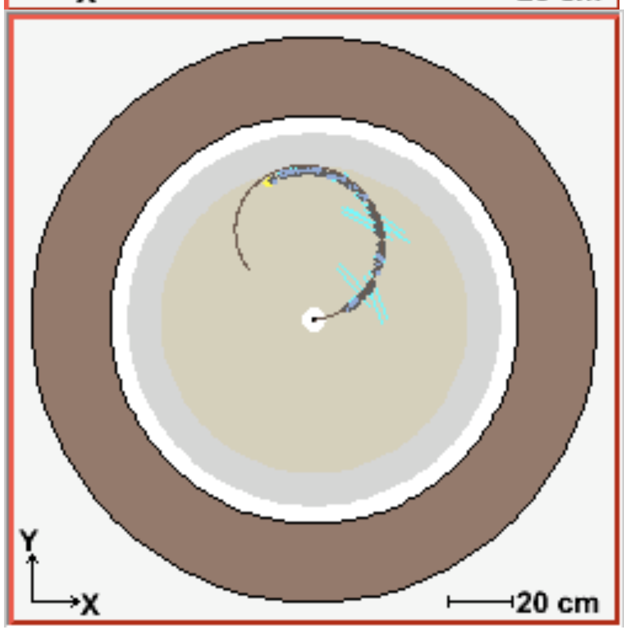


This diagram incorporates the major ideas to come out of the April 18th meeting. Specifically, it bypasses "Hit-Based" tracking and includes a rough start time sufficient for tracking.

Utilize B-Field Map in CDC Track Finder



Uniform B-field



Space-Point Averaged B-field

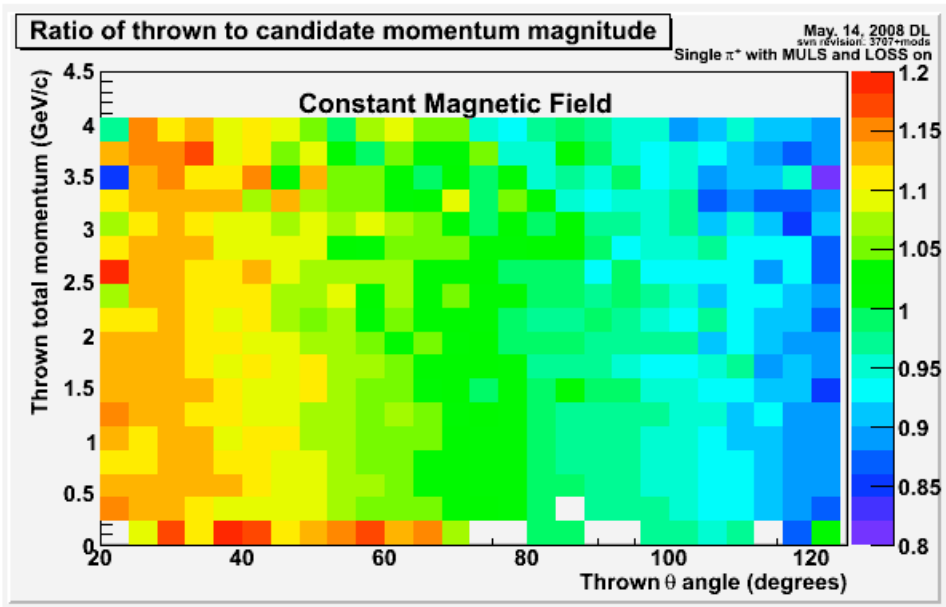
One of the priorities for tracking reconstruction is to improve the robustness of the current finder and fitter.

Part of this includes improving the quality of the candidate parameters coming from the CDC track finder.

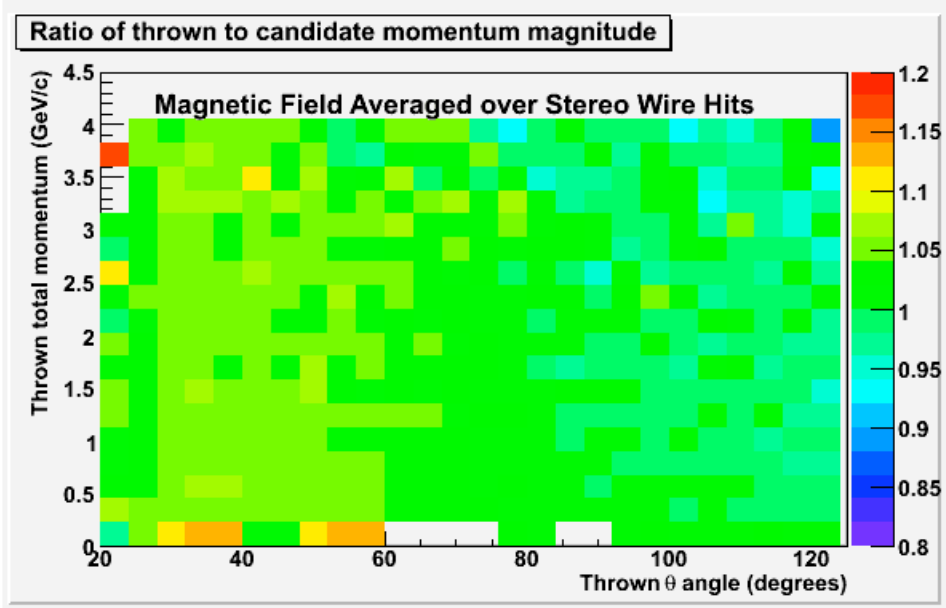
The quality is somewhat limited by the “large” field gradient in the CDC. Until now, the parameters assumed a uniform field of -2.0T.

Recent changes scale the momentum by the average field at each of the stereo hits.

Utilize B-Field Map in CDC Track Finder



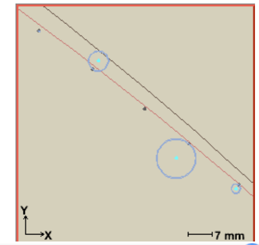
Uniform B-field

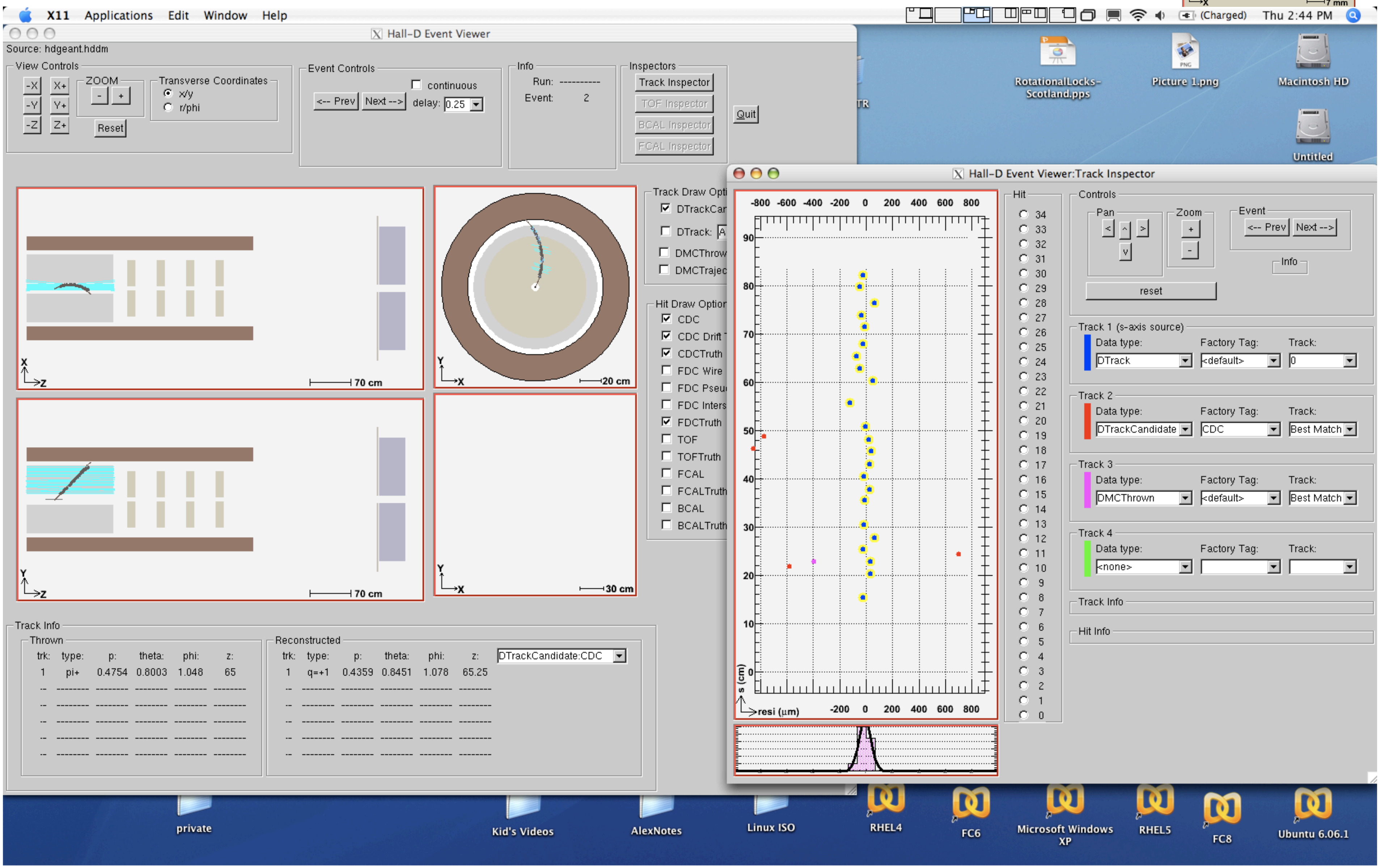


Space-Point Averaged B-field

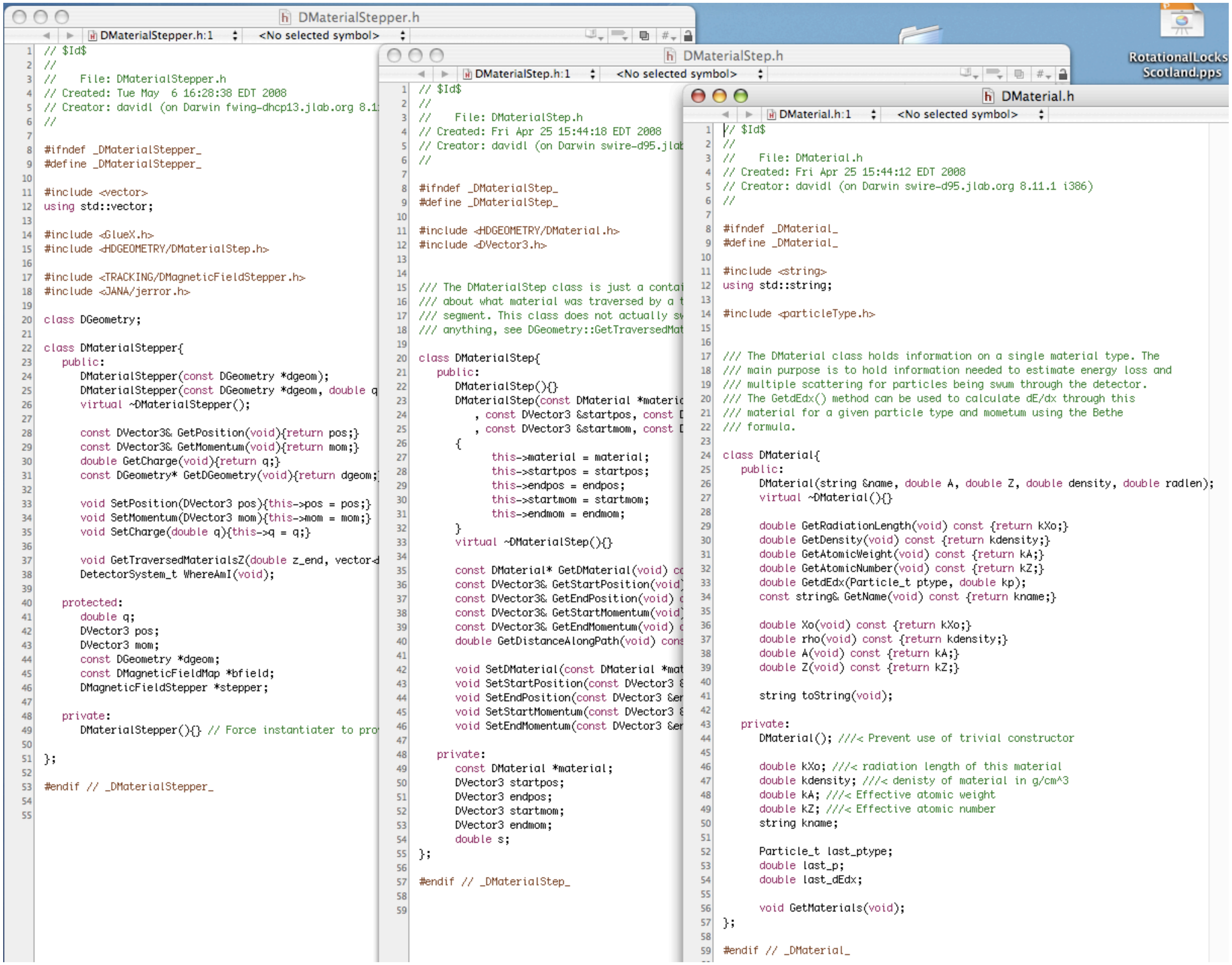
These two plots indicate the determination of the total momentum in the CDC track candidates when using a uniform and space-point averaged value for the magnetic field.

New Track Inspector in *hdview2*





Started Implementing DMaterial classes



Proposed Schedule

Name	Begin date	End date
Width of TOF matched to acceptance	4/7/08	4/16/08
⊟ Address known problems in current fitter	5/22/08	8/14/08
Particle charge mis-assignment	5/22/08	6/12/08
Matching of CDC/FDC track candidates	6/12/08	7/3/08
Fit results is visually worse than candidate	7/3/08	7/24/08
Full tracking efficiences	7/24/08	8/14/08
Study dependence on magnetic field map	9/29/08	11/6/08
⊟ Tracking System optimization	4/7/08	8/7/08
⊟ Geometry optimizations	4/7/08	5/16/08
FDC cable routing upstream	4/7/08	4/16/08
Remove outermost CDC layer	5/15/08	5/16/08
CDC inner and outer shells?	5/15/08	5/16/08
CDC length/FDC position optimization	5/15/08	6/26/08
FDC number of planes/packages	6/26/08	8/7/08
⊟ CDC Stereo configuration optimization	5/16/08	6/27/08
All stereo layers	5/16/08	6/27/08
⊟ FDC Optimizations	5/1/08	9/27/08
FDC beam hole size	8/7/08	8/16/08
FDC stereo angles	8/18/08	9/27/08
FDC angle of incidence effect	5/1/08	5/10/08
Single Wire hit efficiency	4/7/08	4/26/08
Include material in fitter (Kalman?)	5/1/08	5/22/08
Tabulate full covariance matrices with tracking resolutions	8/14/08	9/4/08
HDParSim=superstructure for smearing generator	4/7/08	5/17/08