
Subject: track finder

Posted by [asanchez](#) on Thu, 31 Jan 2008 15:02:52 GMT

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Dear all,
i have a (maybe very stupid) question
concerning the track finder algorithm
in both detectors tpc(rieman or genfit) and geane(stt).

Is the track finder considering
only primaries tracks or is considering
also the secondaries(decays)tracks?

thanks in advance

ALicia S.

Subject: Re: track finder

Posted by [Sebastian Neubert](#) on Thu, 31 Jan 2008 15:12:26 GMT

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Hi Alicia!

The riemann track finder should find all tracks. There is no restriction to primary tracks!

Cheers! Sebastian.

Subject: Re: track finder

Posted by [Pablo Genova](#) on Thu, 31 Jan 2008 16:10:23 GMT

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Hi Alicia,

also the stt track finder is not restricted to primary tracks, as far as I know.
However take into account that the pattern recognition is ideal, i. e. we are still using the Monte Carlo truth.

Also geane can be used both for primaries and for secondaries.

ciao, Pablo

Subject: Re: track finder

Posted by [asanchez](#) on Tue, 05 Feb 2008 10:08:14 GMT

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Dear all,

i have another question concerning the kalman fit implemented for tpc(genfit) and in stt(geane + kalman?).
Additionally to the fit parameters such as momentum, dip angle,...
Is it possible to access to the arc length(s) of the track (XY projection) after the fit with the kalman algorithm?

If yes, i would to know how.

thanks in advance
Alicia.

Subject: Re: track finder
Posted by [Lia Lavezzi](#) on Wed, 06 Feb 2008 11:44:33 GMT
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Hi Alicia,

concerning geane, in the case of propagation to closest approach to the wire/point, there is a function of CbmGeanePro called GetLengthAtPCA() which returns the track length at the point of closest approach. This returns the complete track length (not only the xy projection).

Concerning the propagation to a defined volume or plane this function does not work, since the variable trklength is not filled.

What do you need exactly?

Ciao,
Lia.

Subject: Re: track finder
Posted by [asanchez](#) on Fri, 08 Feb 2008 09:33:41 GMT
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Hi Lia taking a look into the tracks parameters providing by the kalman filter,

one has access to
P momentum
Lambda dip angle
Qp charge/momentun

X0
Y0 after circle fit

Z0 after fitting the line arclength(XY plane)vs Z

lis it true? or I'm wrong. If not

could you tell me which are the parameters given by the kalman fit and in which coordinate system ?

thank you very much
ALiciaS.

Subject: Re: track finder

Posted by [Lia Lavezzi](#) on Fri, 08 Feb 2008 10:37:38 GMT

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Hi Alicia,

after the Kalman fit you have the track in the SD frame representation, so the 5 parameters are: q/p , v' , w' , v and w . You can access them with the functions in `CbmTrackParP` and `CbmTrackPar` (from which it inherits): `GetQp()`, `GetV()`, and so on. You can also access the x , y , z coordinates and the p_x , p_y , p_z momentum components in the master reference system (you find the functions in the same classes).

Since you talk about the dip angle, and maybe you need it, I explain you how to get it: you need to change your representation, from the SD system (`CbmTrackParP`) to the SC one (`CbmTrackParH`), where the accessible parameters are q/p , λ , ϕ , y_{perp} , z_{perp} . To do this you should use the transformation functions in `CbmGeaneUtil`. Consider as an example in the `kalstt` tutorial, in `kalstt/GeaneEx/CbmGeaneTrKalStt.cxx`, the lines from 298 to 327: they actually perform the reverse transformation, from SD to SC.

One more remark: the Kalman filter procedure does not divide the fit problem into two planes (x - y and z -track length), it is performed on a virtual detector plane; the separation of the problem in the two planes is used only during the prefit (that we perform with an helix in `PndSttHelixTrackFitter`).

Hope this helps, but if you need more info please ask

Ciao,
Lia.

Subject: Re: track finder

Posted by [asanchez](#) on Fri, 08 Feb 2008 10:46:01 GMT

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Hi Lia, thank you for your information

I have more questions

In the xyz coordinates system,
What are x_{Perp} y_{Perp} related to? Are they representing some kind of Detector plane (alla Genfit)?

Is then the beam direction paralell to x-Axis?

thank you in advance.

ALiciaS.

Subject: Re: track finder

Posted by [Lia Lavezzi](#) on Fri, 08 Feb 2008 11:25:27 GMT

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Hi Alicia,

first let' s talk about the "perp" coordinates, so about the CbmTrackParH representation: the yperp and zperp (not xperp-yperp!) define a plane orthogonal to the particle direction. When you use the CbmTrackParH representation, you describe the track in the SC frame, which is defined by the three orthogonal axes xperp, yperp, zperp, where xperp is along the particle direction, yperp is perpendicular to xperp and parallel to the xy plane (in the master reference system, MARS) and zperp is the third axis chosen in order to have an orthonormal reference frame. So the yperp-zperp plane turns out to be a plane orthogonal to the particle direction. So, concerning the second question, the beam direction is not chosen parallel to the x axis in MARS, it is generated random, but the xperp axis in SC is in each point chosen parallel to the particle direction.

Just one clarification: for the STT we use a different detector plane, which is not perpendicular to the track and that' s why we use the CbmTrackParP representation instead of the CbmTrackParH one. CbmTrackParP, let' s say, allows you to define your own detector plane (virtual or not) and to get the track parameters on it.

Ciao,
Lia.