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Subject: Re: Helix and FairTrackParH

Posted by [Lia Lavezzi](#) on Thu, 23 Jul 2009 20:02:44 GMT

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Quote:Quote:1) in FairTrackParH you have the 5 parameters: q/p, lambda, phi, yperp, zperp. q/p is the charge over momentum, lambda and phi are the dip and polar angles which describe the direction of the particle, yperp and zperp are the coordinates of the point in the SC reference frame (the one perpendicular to the momentum). Using the functions of that class you can also get the position and momentum in the master reference frame;

Let me correct you, in FairTrackParH the parameters are:

```
/** fLm = Dip angle **/  
Double_t fLm;  
/**fPhi = azimuthal angle **/  
Double_t fPhi;  
/** Points coordinates in SC system */  
Double_t fX_sc, fY_sc, fZ_sc;
```

Ok, it' s just a matter of names

If you have a look in the FairTrackParH.h, the comment at the beginning contains the 5 parameters:

q/p, lambda, phi, y\_perp, z\_perp

In the code the name of the parameters are:

```
fLm = lambda  
fPhi = phi  
fX_sc = x_perp  
fY_sc = y_perp  
fZ_sc = z_perp
```

Concerning the names of the coordinate, let me explain: usually the SC frame coordinates are marked as "orthogonal" x, "orthogonal" y and "orthogonal" z, just because the SC frame has its yz plane orthogonal to the track momentum.

When you describe the track you need, of the 5 parameters, 1 parameter to describe the momentum magnitude (fQp is a data member of FairTrackPar), 2 to describe the direction (lambda/phi) and 2 to describe the position (y and z... call them \_perp or \_sc, they are the same thing).

Quote:Well, can I consider x\_sc y\_sc z\_sc as the starting point of the helix? In this case can phi be considered as phi0?

Actually I don' t think so: phi is given with respect to the z axis, while phi0 is given with respect to an axis which passes through the center of curvature of the helix; you could consider phi = phi0 only if the helix axis was the z axis. At least this is what I understand...

Quote:For this reason I think it would be good to have written somewhere the definition of the FairTrackParH parameters, to avoid misunderstanding (such as phi and phi0) and in order to avoid ambiguity.

There is a definition of the parameters in our report on GEANE, since the parameters for both FairTrackParP and FairTrackParH are the ones used there (in GEANE, I mean) in the SD and SC frame. Maybe we can add a link in the code comment to easily get it. Would it be useful?

Ciao,  
Lia.

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