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Subject: Bug in GenfitTrack2PndTrack

Posted by [StefanoSpataro](#) on Mon, 31 Aug 2009 12:19:08 GMT

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Hello,

playing with kalman I have found there is a small bug in the converter from genfit Track to PndTrack. I am converting Track to PndTrack with the following code in PndLheKalmanTask:

```
Track *trk;
...
...
cout << "Trk fin:" << endl;
trk->getMom().Print();
PndTrack *fitTrack = (PndTrack*)GenfitTrack2PndTrack(trk);
cout << "pndtrk fin:" << endl;
fitTrack->GetParamFirst().GetMomentum().Print();
```

Once I plot the momentum value before and after the conversion, I have (for different events):

Toggle Spoiler

Trk fin:

TVector3 A 3D physics vector (x,y,z)=(1.373069,0.210701,1.478064)  
(rho,theta,phi)=(2.028395,43.223627,8.724142)

pndtrk fin:

TVector3 A 3D physics vector (x,y,z)=(1.373069,0.210701,1.478064)  
(rho,theta,phi)=(2.028395,43.223627,8.724142)

Trk fin:

TVector3 A 3D physics vector (x,y,z)=(-0.780230,1.078801,1.491037)  
(rho,theta,phi)=(1.998940,41.762353,125.875875)

pndtrk fin:

TVector3 A 3D physics vector (x,y,z)=(0.780230,-1.078801,-1.491037)  
(rho,theta,phi)=(1.998940,138.237647,-54.124125)

Trk fin:

TVector3 A 3D physics vector (x,y,z)=(-1.743418,-0.130269,1.215589)  
(rho,theta,phi)=(2.129350,55.188850,-175.726788)

pndtrk fin:

TVector3 A 3D physics vector (x,y,z)=(1.743418,0.130269,-1.215589)  
(rho,theta,phi)=(2.129350,124.811150,4.273212)

Trk fin:

TVector3 A 3D physics vector (x,y,z)=(1.259328,-1.327701,0.748083)  
(rho,theta,phi)=(1.976948,67.765194,-46.513927)

pndtrk fin:

TVector3 A 3D physics vector (x,y,z)=(1.259328,-1.327701,0.748083)  
(rho,theta,phi)=(1.976948,67.765194,-46.513927)

Trk fin:

TVector3 A 3D physics vector (x,y,z)=(-0.233548,-1.536000,1.323097)  
(rho,theta,phi)=(2.040693,49.582170,-98.645565)

pndtrk fin:

TVector3 A 3D physics vector (x,y,z)=(0.233548,1.536000,-1.323097)  
(rho,theta,phi)=(2.040693,130.417830,81.354435)

Trk fin:

TVector3 A 3D physics vector (x,y,z)=(1.221191,1.319585,-0.811028)  
(rho,theta,phi)=(1.972404,114.279440,47.217711)

pndtrk fin:

TVector3 A 3D physics vector (x,y,z)=(1.221191,1.319585,-0.811028)  
(rho,theta,phi)=(1.972404,114.279440,47.217711)

Trk fin:

TVector3 A 3D physics vector (x,y,z)=(-1.651799,0.864065,0.744961)  
(rho,theta,phi)=(2.007490,68.217108,152.385683)

pndtrk fin:

TVector3 A 3D physics vector (x,y,z)=(1.651799,-0.864065,-0.744961)  
(rho,theta,phi)=(2.007490,111.782892,-27.614317)

Trk fin:

TVector3 A 3D physics vector (x,y,z)=(1.753957,0.354045,0.912949)  
(rho,theta,phi)=(2.008778,62.968538,11.412095)

pndtrk fin:

TVector3 A 3D physics vector (x,y,z)=(1.753957,0.354045,0.912949)  
(rho,theta,phi)=(2.008778,62.968538,11.412095)

(the numbers taken from muons at 2 GeV,  $5^\circ < \theta < 140^\circ$ ).

You can see in red that during the conversion, for some tracks,  $\theta \rightarrow 180^\circ - \theta$ ,  $\phi \rightarrow \pm(180^\circ - \phi)$ .

It seems that during the conversion the direction of the track is somehow inverted, and this screws up the outgoing momentum (I have not checked the other parameters).

Would it be possible to fix it? Of course even the correlation to the other detectors is completely screwed up.