Subject: Geane interface in PandaRoot
Posted by Mohammad Al-Turany on Wed, 20 Jun 2007 09:49:01 GMT
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Hi,

in SVN 932 two new directories are added

1. trackbase: Helix and parabola track parameter classes

2. geane : Interface to FORTRAN geane package

For now only propagation to PLANE and Volume are implemented, for propagate to volume the helix rep. is used and propagate to plane uses the parabola (due to limitations in Geane original code a work around is in preparation!)

After discussing with Andrea Fontana we agreed not to put in SVN the example I have for geane (Muon chamber of CBM), Andrea will deliver within the next few days an example using the Panda detector. Please be aware that this release is still very preliminary and has some errors which we hope to correct in the near future

regards

Mohammad

Subject: Re: Geane interface in PandaRoot
Posted by Anonymous Poster on Thu, 21 Jun 2007 08:17:35 GMT
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Hi,

I am in the summer school in Varenna right now, so I wont have a chance to test this before the Dubna meeting. It is great to see progress being made and I am looking forward to see the code in action.

CU, Christian

Subject: Re: Geane interface in PandaRoot
Posted by Sebastian Neubert on Thu, 21 Jun 2007 15:22:19 GMT
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Hi!

I am currently working on the implementation of the geane stuff into genfit.
Question: In the helix parameters it says (x,y,lambda,phi,q/p) but in the whole geane-papers x_sc is along the track, so it should always be 0. Is there a confusion here? Or do I

misunderstand something?

Moreover which parameters are the covariances refering to and how are they organized, being represented as a double[15]?

In order to be able to write a decent constrcutor GEANETrackRep(const TrackParH& par) the accessors in the TrackPar-class should be declared const.

Cheers! Sebastian.

Subject: Re: Geane interface in PandaRoot
Posted by Andrea Fontana on Thu, 21 Jun 2007 19:35:38 GMT
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Dear All,
we have received the interface from Mohammad yesterday and
are now working to integrate it with the new features that
we developed with the old interface. So for now you will only
find the standard Geane in svn, not yet, for instance, the propagation to the point of closest approach.
So, please, be aware of this!

I will update the files as soon as we are happy with the results
that we now have with the old interface: only at this point
I would expect meaningful results from the integration in genfit.

Moreover I will also prepare an example in the form of tutorial
to show how to use extrapolate to closest in case of STT.

Coming to the questions from Sebastian:

- it is correct that x_sc in the SC system is zero, but also
  y_sc and z_sc are zero (see eq. 38 of our report and the whole
  section 5). What matters is that in the SC system the
  variations different from zero are: delta_y_perp, delta_z_perp
  and delta_l_perp (l or s is the track lenght). In geane x
  is always along the momentum, but recently also Wittek
  has changed convention(see NIMA 566(2006)687):
  this is however only a convention without any consequence since
  only errors are treated. In the interface we will always
  maintain the old convention (along x).
  Looking at the class CbmTrackParH, there is some redundancy
  as a few variables are useless: we plan to clean it up.

- the covariance matrix is a symmetric triangular 5x5 matrix,
  so it only has 15 independent components: the correspondance
  is again on our report, page 35. I send you in attachment
  2 functions written by Alberto for the conversion.

- I agree on the const!

As we decided in Ferrara, we now are working to release as
soon as possible the new interface to the Collaboration.

Best regards to all,
Andrea

File Attachments

1) FromMat25ToVec15.C, downloaded 653 times
2) FromVec15ToMat25.C, downloaded 557 times

Subject: Re: Geane interface in PandaRoot
Posted by Sebastian Neubert on Fri, 22 Jun 2007 11:36:52 GMT
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Hi Andrea!

Thanks for your reply.
I would suggest, that we use the ROOT-Matrices for the covariances, to take advantage of the nice features of these.
The paper by Wittek and Strandlie explicetely states that tracking becomes unstable when performed with single (=32bit) precision. So I do not understand why in the interface the covs are declared as double32_t.
Finally there is the issue that we have discussed under the term of "virtual detector planes". The corresponding representation would be in the SD-system. Can you help me to find this in the interface, please!?

I will wait until you have cleaned up and checked in the new features befor proceeding in genfit.

Have a nice weekend!
Cheers! Sebastian.

Subject: Re: Geane interface in PandaRoot
Posted by Mohammad Al-Turany on Fri, 22 Jun 2007 16:58:54 GMT
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Hi,

Double32_t means 8 bytes in memory, written as a 4 bytes float in file, so this will not have any effect on the stability of the calculations!! and speaking about stability all calculations are done in the FORTRAN part which use float! Any way the Double_32 was only in the CbmTrackParP.h I simply forget to remove it there. In SVN 981 now there is no Double32_t any more, hope that this will make the code more stable!

Subject: Re: Geane interface in PandaRoot
Posted by Anonymous Poster on Sat, 23 Jun 2007 08:34:50 GMT
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Hi everybody,

I think is important to note in the discussion about the float precission, that what Wittek published is not directly related to GEANE! He might be the original author of some routines which are used in GEANE, but any developement of his stuff (e.g. using double precision now) may very well not be included in the FORTRAN routines of GEANE.
I think in the moment this is probably not so important, but it will have to adressed at some time.

Regards, Christian

Subject: Re: Geane interface in PandaRoot
Posted by Andrea Fontana on Mon, 25 Jun 2007 07:15:13 GMT
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Hello Sebastian,
thank you for waiting, I hope it will not take long: this week Alberto, Pablo and myself will work almost full time on this and I made some progress in the weekend already! I will keep you up to date when there are news.

Regarding the virtual detector planes there was a long and very useful discussion among Mohammad, Christian and myself two VRVS meetings ago (I seem to remember you were not present that day): anyway, as I understand it, to use virtual plane with the extrapolate to the point of closest approach everything can be done in the SC. In fact we extrapolate to a given length (and this is in the SC, i.e. with errors projected in the plane orthogonal to the track) and the virtual plane is by definition orthogonal to the track. So the conclusion to this was that the first interpretation (change from SC to SD) as written in your note is perhaps not necessary. I have to try it to become sure about this, but I think it might be correct: to be safe we have also recoded in double precision the Tr.... routines in case we need them one day.

Concerning the precision issue, I agree with Christian: this might be a problem, but this depends on the material budget and it is difficult to predict it now. I am in touch with some people in CMS that are studying this effect with the native GEANE and they will let me know if there are problems.
But we can pospone this if it will become an issue...

Talk to you soon...

Ciao,
Andrea