Subject: Study of tracking efficiency and resolution
Posted by donghee on Tue, 02 Oct 2012 20:21:55 GMT
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Hi PANDAroot experts,

I'm posting my simulation macros for track reconstruction study which I have shown in the PANDAroot meeting at 2.Oct.
Also, the presentation is enclosed in this post.
In this study, I tried to show the resolution and efficiency of single particle using both target and forward track reconstruction.
I am afraid that I was going the wrong way while doing this test.
Please let me know if you find something wrong in this macros.
I used the july12 release version of PANDAroot.

I would like to understand two issues.
How will the resolution be improved when the forward track is added into the track reconstruction. (A bug is in the analysis macro?)
Why the efficiency of low momentum tracks are significantly dropped down in the region of theta > 90 degree (backward directed track).

ps, I don't know how can I put these files via SVN...

Thank you for your interest and help in advance.
Donghee

File Attachments
1) run_track_sim.C, downloaded 377 times
2) run_track_dig.C, downloaded 362 times
3) run_track_rec.C, downloaded 349 times
4) run_track_pid.C, downloaded 345 times
5) run_track_his.C, downloaded 380 times
6) Group_Meeting_2012_10_2.pdf, downloaded 344 times

Subject: Re: Study of tracking efficiency and resolution
Posted by StefanoSpataro on Wed, 03 Oct 2012 07:28:18 GMT
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Can you take out the montecarlo identification and check if you see candidates below 10 degrees?

Subject: Re: Study of tracking efficiency and resolution
Posted by donghee on Thu, 04 Oct 2012 10:56:39 GMT

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Hi Stefano,

I will check it...

Best wishes,
Donghee

Subject: Re: Study of tracking efficiency and resolution
Posted by donghee on Fri, 12 Oct 2012 10:03:47 GMT
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Hi stefano,

I found a reason for the inefficiency of 10 degree track.

When I studied tracking performance, I produced a point particle at exactly 10 deg. It was presented in last meeting.

When I produce single track in the range 0.5 and 20 deg with 1-5 GeV momentum as a continuous spectrum,
I can see correct tracks from both spectrometer (forward and target).
The combined track in Pid session is working properly.
But at 5 deg starts droping down the efficiency till 10 degree.
the reconstruction at 10 deg is quite inefficient due to some reasons, material effect or mainly rough connection of both tracklet in the overlap region between target and forward spectrometer.

I'm not surprising the reason for inefficiency at 10 deg at all.

I'm trying to answer now for next question about inefficiency of backward part with low momentum (~ 300 MeV/c track).

Best regards,
Donghee

File Attachments
1) Forward_study_acceptance10.eps, downloaded 300 times

Subject: Re: Study of tracking efficiency and resolution
Posted by StefanoSpataro on Fri, 12 Oct 2012 10:39:09 GMT
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Hi Donghee,

I am not surprised of such effect.
Indeed, we have a central tracker code wich covers mvs+stt+gem, and a forward tracker covering mvs+gem+fts. In between these regions, tracks should be seen only by mvd+gem, w/o stt and w/o fts, and both the already existing code cannot be used. The mvd+gem code is existing, written by Radek, but never raccomended.
If you consider that the coverage of fts is an ellipse wiht 5° and 10° as axis, I believe that between 5° and 10° acceptance decreases. If you could select one theta, i.e. 7.5°, and plot as a function of phi, I believe you could see such obscillations.

Probably we would need to start thinking about also such region.

Subject: Re: Study of tracking efficiency and resolution
Posted by donghee on Fri, 12 Oct 2012 14:25:43 GMT
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Hi,

So, there are some progress to improve interesting overlap region.
That sounds very good.

cheers,
Donghee
