
Subject: About Reconstruction

Posted by [Jifeng Hu](#) on Tue, 09 Jul 2013 08:27:57 GMT

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Dear all,

I wonder to know (1) whether the existed implementation of EMC reconstruction associate charged tracks with showers? (2)

after a full reconstruction for all sub-detectors, whether PndTrack is the only interface to access all tracks, both charged and neutral ones? (3) under time-based simulation, how to organize these tasks together to reconstruct tracks using time information?

BTW, at present, within time-based framework, only implementation for photons has been done.

Subject: Re: About Reconstruction

Posted by [Stefano Spataro](#) on Tue, 09 Jul 2013 08:36:03 GMT

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(1) the association is done inside the PndPidCorrelator

(2) the starting object is the PndPidCandidate, for both charged and neutral particles.

Subject: Re: About Reconstruction

Posted by [Jifeng Hu](#) on Wed, 17 Jul 2013 08:58:43 GMT

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I read the pid packages in last week.

Considering a fully

time-based reconstruction for EMC, the time-stamp will be used.

To identify a shower belongs to which event, we need compare the shower's time (T_{shower}) to the event time (T_{evt}), suppose the event time is determined by the fastest TOF detector for events containing charged track, or determined by EMC for neutral decays.

Usually, $T_{\text{shower}} = T_{\text{evt}} + T_{\text{flying}} + T_{\text{signal}}$, this means from the event time T_{evt} , one track spent T_{flying} time and hit EMC, then spent T_{signal} time and produced a shower.

And now I hope to get a calibrated event time by calibrating T_{shower} , so the flying path is needed. this work has been done for photons. The flying path is easily taken as a straight line by connecting the hitting position with the collision vertex.

However, a little hard for charged tracks, because

<1> After associating charged tracks with showers, how to access the flying path between origin and EMC hitting position? Since the helix parameters only offer the path inside tracking detector without any extrapolation?

<2> with different charged particles hypothesis, calibration results should be different.

what are your opinions? many thanks.

Subject: Re: About Reconstruction

Posted by [Stefano Spataro](#) on Wed, 17 Jul 2013 15:36:47 GMT

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Hi,

about track length from the interaction point to the EMC, you could take a look into the method I wrote for the tof in `PndPidCorrelator::GetTofInfo`. You can see there that you have a `tofLength` which is the sum of the two extrapolated parts, from ip to last point of the track, from last point of the track to tof. Geane has a function which calculates the path length, then it is very easy. If you don't want to use geane, from the helix, in theory you could do the following: from the pt you can calculate the circle radius, and you have to add quadratically the "z" component. In this sense you have a path length valid ONLY where the field is constant, i.e. it will not work in the endcap regions.

In theory the radius depends on the momentum and not on the particle type, then I believe one parametrization is enough. The only different thing is the energy loss for different particle, but I believe it will not change so much the path length.
