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ChPartReco package

1 Introduction

ChPartReco is a reconstruction package that creates $ChargedParticle$ objects using global tracks and vertices as input and stores results in $ChargedParticleChunk$.

2 Selection of global tracks

All the tracks in a $GTrackChunk$ are used to make corresponding $ChargedParticle$ objects.

3 Vertex matching

For each $GTrack$ a $Vtrack$ is made and a χ^2 calculated for the distance of closest approach to all the found vertices using the $get_impactParameters$ method from $Vtrack$ which gives radial and z distances between the vertex and the point of closest approach (DCA) of the track to the beam line. The 4-momenta (+errors) are calculated at DCA. There is a maximum χ^2 allowed for primary vertices defined by parameter PVcutoff, and for secondary vertices by SVcutoff (these parameters are set in ChPartReco.rcp).

4 Calculation of Energy Flow around the ChargedParticles

For each ChargedParticle with pT greater than $iso_Ptcutoff$ scalar Et of all other charged particles within a cone of radius iso_R is summed, if they have have a χ^2 of less than iso_chi2 with respect to the vertex of the ChargedParticle, and z difference between tracks at DCA to the beam is less than Z_cut.

Arbitrary number of radius-chi2 pairs can be selected in ChPartReco.rcp. The largest energy in all cones is compared to the rcp parameter $iso_Etcutoff$. If it is less, the particle is considered isolated and energies in all cones are added to the corresponding ChargedParticle object.

5 Making ChargedParticle object

In addition to 4-momentum and error at DCA, and a $LinkIndex < GTrack >$, two vectors of $LinkIndex < Vertex >$ are stored in $ChargedParticle$, ordered in increasing value of χ^2. One is for primary vertices and the other for secondary vertices. The LinkIndex to the primary vertex with smallest χ^2 is always stored (ie even if >PVcutoff). Corresponding vectors of the χ^2's are also stored. If there are no vertices the vectors will be empty.