Proposal

The Tracker Reconstruction Data Branch
of GLAST test beam ROOT tree

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January 28th 2000

The tracker reconstruction output data should contain all the relevant information of reconstructed tracks and gamma; its structure should be flexible enough to allow the "user" to incorporate and change data; its should also contain enough information to refit/display the tracks.

The event class in the ROOT tree has a pointer to trackerRec. TrackerRec is a list of trkRecObj objects. These objects are the high level data returned by the tracker reconstruction algorithm.

trkRecObj	
Type()	Type = gamma, track, etc (room for the future)
Id()	Id number
Mother()	Pointer to the mother trkRecObj object (i.e track(electron)->gamma)
chiSq()	Chi-square of the fit Quality()
Quality()	variable used to order the trkRecObj
IniLayer()	The first silicon plane where the trkRecObj has hits
NHits()	Number of hits
EneInput()	Energy used in the construction of the trkRecObj
EneDeter()	Energy estimated using tracking only information
* trkLocatorList	List of trkLocators objects
* trkHitList	List of trkHits of the trkRecObj

A trkLocator Object contains the track direction and its error at a given position. All trkRecObj have a trkLocator at the vertex position. Other locators could be added, for example: at the calorimeter plane.

trkLocator	
Type()	Type = vertex, si layer, calorimer layer, ACD tile, others
Id()	Id number (i.e if type = si layer, id = si layer number)
Vx(), Vy(), Vz()	Position X,Y,Z in mm
Slope_x(), Slope_y()	Direction of the track at this position, slope_x = Px/Pz and slope_y = Py/Pz, where P is the vector of the direction.
sigma_x(), sigma_slopex(), cov_x()	Errors in position, tangent and covariance for the X
sigma_y(), sigma_slopex(), cov_x()	Errors in position, tangent and covariance for the Y

The trkHit are the Si Hits used to define the trkRecObj. They could be used to display/refit the trkRecObj. They are associated with the tracker data of the ROOT tree. The "user" could decide to empty the trkHisList for certain trkRecObj objects.

trkHit	
layer()	Silicon layer
stripAddress()	Strip number
XY()	X or Y view

An example: A gamma interaction where the electron and positron tracks have been reconstructed, and with no other tracks in the event, has three trkRecObj objects: one of gamma type and two of track type (the electrons).
The trkLocator at the vertex for the trkRecObj of gamma type contains the gamma direction and the trkLocator at the vertex of the trkRecObj of track type contains the electron/positron track direction. The electron/positron trkRecObj maybe have another trkLocator at the calorimeter position. The trkHitList of the gamma could be, if desired, empty.