Babar model – use of associators for MC truth

<u>Olivier's talk</u>
ProtoPart and ProtoPV are output of reconstruction. Classes contain pointers to other info.
Do we mean IDs? (for persistency)?

No origin vertex in Particle class?

Decay chains should be described in similar way to MC truth.

Is PrimaryVertex a class? Why is it a different class from ProtoPV?
- there is probably commonality to be extracted in a Vertex base class.

Philippe says there are Particles instantiated from ProtoPart that are not in a decay tree (I
didn't follow this…)

What about invisible particles (neutrinos) that are not in the ProtoPart list? How do you
add these to a vertex?

Locking mechanism?

Olivier's diagrams are object diagrams, not class diagrams. Need to identify classes (and
base classes – e.g. want same base classes to describe decay tree and MC truth)

Akram pushes idea of composition tools, which are more clever than decayvertexer.
Composition tool does more complex things, such as doing pi-zero search from a photon
list.

Doing this in Reconstruction program means storing as protoparts both the mother
particle (e.g. K0) and the daughter tracks – complicating things.

Callot: why are protoparts different from Particles – apart from fact that they should nt be
touched by user? Difference is that once a Particle has a particle hypothesis, some
protopart attributes become meaningless.

Suggest that ProtoPart should also be a proto decay tree – perhaps only with primary
vertex, but possibly also K0 etc.

Markus reminds that for MC studies you will have input to same tools from MC truth.

Fiedler – tools to mix events

How are ghosts handled? Can't use protoparts that share majority of hits. Hans wants to
do this in protopart definition. Olivier not sure this can be done at DST production.

Gloria: need tool that, given two particles, says they are mutually exclusive. Should be automated as much as possible – e.g. vertexing tools should check this.

Means that protoparts on DST have enough info to make above checks.

Not clear how to handle neutral objects – e.g. how to handle merged pizero?

Do we want to reconstruct all possible candidates on all events at DST production? If we don't have enough CPU, we might want to make some protoparts (i.e. part of reconstruction) at analysis stage

Electron candidate is not a protoparticle. Protoparticle should have electron hypothesis.

Track protoparticle may not be the same as a neutral protoparticle. Philippe suggests a very simple common particle, plus association to a track or a neutral cluster. I.e. don't carry all info inside protoparticle object.

AlgTools to do specialised selections, such as pizero search, should use same analysis mechanisms. There maybe a base class for such selectors.

Need to be careful when doing vertexing of e.g. J/psi phi, to use the four tracks to do the vertex if user wishes.

Protopart is a light object – has methods to access required data

Particle does not have parent vertex. Why? You can make copies of Particles if you make different hypotheses. Having parent simplifies navigability of decay tree. Same as MC tree. In any case need method to get origin vertex. Think it's fine to create copy of Particle in each case it reused for a different decay tree. Need to understand cost of making a copy.

Why do we create particles at the beginning? Work on protoparticles for selection, convert selected ones to Particles.

Particles are not necessarily in transient store – only register those that make sense.

Pere suggests rapid convergence in design. Make prototype, then real world analysis as use case to find the problems.