Discussion on notes for ID's, Hits & Digits

❖ Logical Identifiers

- Since the last software week, a draft note has been circulated (to offline coordinators and DB task leaders) with a proposal for structure of logical hierarchical identifiers for each detector subsystem

- Proposed conventions
  - Follow PBS for system and subsystem
  - Numbering should increase with spherical coordinates: radius, eta, phi
  - Numbering in general should begin with 0
  - eta is special: start from 1 and allow +/- numbering, reserve 0 for elements straddling eta = 0

Logical Identifiers (2)

- There was some discussion on the eta convention
  - eta = 0 works well for special Muon stations
  - while pixels would have -1, 0, 1, SCT's would have -1, 1
  - → propose to apply convention across all systems
    - use helper classes to find neighboring ID's
    - don't rely on adding 1 for neighbors

- Otherwise, there was general agreement on the id hierarchies

- Received feedback to include ids for Level 1 trigger towers

- Next steps:
  - include explicit value ranges for ids of each subsystem
  - circulate note widely for comments
  - submit to CSG for final approval

- Time scale: end of June have circulated a complete note

Hits and Digits note

- ❖ Along with the ID note, there was circulated a draft note which will eventually define

  - hits and digits for Geant4

  - description of hit to digit transformation

  - pileup procedure

- ❖ Included in the note was a compilation of the current definition of hits and digits use for Geant3

Hits and Digits note (2)

❖ In the discussions so far, Dario has proposed a unique form for hits for tracking detectors

- Eloss segments: start/end points, eloss, time, kine: 36 bytes

- Should be OK for pixels and SCT

- Would like feedback from TRT and Muons

- I expect that more work is needed on how to deal with "kine" or associations to the truth tracks

❖ Hits for LAr will be summed by readout channel

- May want finer than cell granularity

- Some discussion on what sort of kine information is needed

❖ TileCal hits will sum in finer granularity than readout

Hits and Digits note (3)

❖ **Digits should be what is "read out"**

- Normally, this should mean what comes out of the RODs

- Some exceptions:
  - Simulation of the functioning of the LAr RODs - must simulation input to RODs from Hits

❖ **Finally, there will be input coming from the Level 1 trigger for simulation of trigger tower response**

- There are some constraints to be able to study correlation between trigger tower response and standard readout
  - adding of noise, signal shaping

- Will include needs for Level 1 in note

Hits and Digits note (4)

❖ Time scale and planning

- Would like to see a more complete note with proposal for end June
  - hits and digits for all systems and level 1
  - hits to digit description
  - pileup description

- Will then need to discuss how to proceed
  - get feedback and approve proposal
  - understand whether we can migrate the G3 hits and digits to new definition
  - set up infrastructure for Geant4