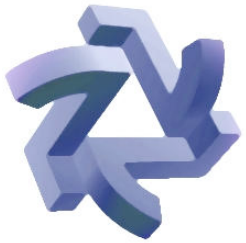
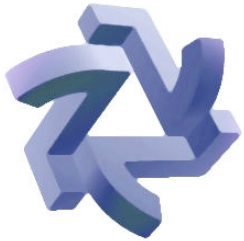


Universal Ntuples

Brian Rebel

11/12/04

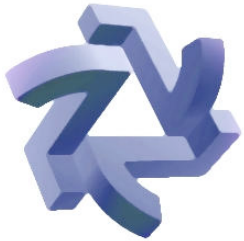


Requirements for "Universal" Ntuple

- Analysis ntuples need to be organized by events rather than snarls
- Ntuples used by different groups will have some aspects in common
  - Header-type info: Run, Sub-Run, Snarl, Event
  - Event information - number of planes, total charge, number of reconstructed tracks and showers
  - Track/Shower information
  - MC truth information where applicable

Requirements for "Universal" Ntuple

- Analysis ntuples will not be same for each group because different groups will use different quantities derived from standard ntuples
  - UV asymmetry in tracks/showers
  - Inverse beta
- There should be standardized conventions for naming variables
  - Quantities associated with tracks should start trk, etc
  - For example branch holding track length could be trkLength
- Quantities common between all groups should have the same names in each analysis ntuple

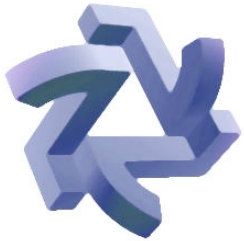


One Solution - NtupleHelper Package

- NtpHelper object keeps track of events and which showers/tracks/ strips are associated with the event
- NtpHelperModule generates the analysis trees
- Analysis trees are defined in module BeginJob method
  - Standardized entries along with user defined quantities setup in the tree there
- Module Ana method fills the analysis ntuples by looping over the reconstructed events in the NtpSRRecord
- Several methods included for users to fill with analysis code that looks at track/shower/event properties using NtpSREvent/Track/ Shower objects to fill the trees
- These methods contain the code to fill the standardized information as well

Benefits of NtupleHelper

- Compiled code so it runs faster and is easier to debug than macros
- Module allows users to look at one record at a time
  - Can use R1.9 ntuples without worrying about different trees being out of sync
- Module is configurable for flexibility
  - Allows users to test different cuts values, etc without recompiling
- Can also add in code to do special operations like generate event displays based on selection criteria defined by the user



Outstanding Issues

- Ntuples from different analysis groups can be compared using the AddFriend utility
  - Requires the trees to have the same number of entries
  - Trees have to be filled in the same order - no guarantee of this if non-standard reconstruction algorithms or parameters as used.
  - Can always do it the hard way by looping over the trees and looking for Run/Sub-Run/Snarl values