A High-Level Reconstruction Week at DESY

ILD sw/ana meeting, June 10 2015

Jenny List
on behalf of the ILD software and analysis conveners

A High-Level Reco Week

- goal:
  - converge on an update of ILD reconstruction incl. ILDConfig
  - which captures recent improvements
  - will go into final Mokka-compatible legacy release v01-17-08 (?)
- date: July 6-10
- location: DESY
- character:
  - mainly experts, ~10-15
  - few talks, lots of discussion & hands-on work
- agenda/registration at https://agenda.linearcollider.org/event/6787

General Idea on Time Structure

1 "main topic" per day
- ~ 45 min. presentation(s) in the morning (more on day 1):
  - either 1 overview talk
  - or several shorter contributions
- then break-up into discussion / hands-on groups on sub-topics
- in between: joint lunch / coffee
- end working day with 45-60 minutes presentations from subgroups / joined discussion

stay flexible – don't expect to see every minute filled on agenda page ☺

List of Topics – Current View

Preparation work has started => some of these might get clarified beforehand!

- Particle ID
  - photon reco
  - pi0 reco
  - tau reco
  - dE/dx
  - cluster shape
  - isolated leptons
- FlavourTag
  - life time
  - lepton pt ?
  - vertex charge
  - vertex mass
- MarlinKinfit
  - b jet treatment
  - vertex fitting
- MatrixElements
  - interface Helas / Omega

- JetFinding
  - Marcel's JetFinder
  - vertex-based jetfinding
  - ColorSingletJetFinder?
- BeamCalReco
  - new parametrisation?
- PFO uncertainties
  - p covariance matrix
  - jet by jet energy uncertainty
- Truth information
  - RecoMCTruthLink
  - TruthVertexFinder
  - TruthColorSingletFinder
- DST Format
- anything else ?

Preparations

- have started:
  - in convener's fuze meetings
  - in the remaining Wednesday phone meetings, today:
    - Masakzu: LCFI
    - Andre: BeamCalReco
- prepare "to do"s for individual topics
  - highlight some on the next slides…

Particle ID

- dE/dx processor: Track & Hits in, fill dE/dx and error in MarlinTrkTrack
  - needs to be adapted from MCTruth-based scheme
- attach to PFOs output of separate processors for:
  - dE/dx-based likelihood
  - cluster shapes based likelihood p > 1GeV
  - cluster shapes based likelihood p < 1 GeV
- pi0 and taus:
  separate collections pointing to main PFOs
- reminder PID & LCIO:
  - ParticleIDVec& ReconstructedParticle::getParticleIDs()
    vector of ParticleIDs assigned to a ReconstructedParticle,
  - same for Cluster, but not for Track!
  - class ParticleID:
    - getType()   -   ?
    - getPDG()   - eg 11
    - getLikelihood()   -   eg 90%
    - getAlgorithmType() - eg dE/dx

  - need to define how to use this, eg see above!

Isolated Leptons

- currently most used:
  - from Higgs self-coupling analysis
    - Z -> ll, with brems-pickup for e+e-
    - single isolated mode
  - add PID likelihoods
  - release in MarlinReco
- alternatives:
  - Taikan & Yuji: also isolated tau's !
  - Delphi lepton-finder: only inside SGV?

Flavour Tag

- LCFI updates (hear more from Masakazu today)
  - add new vertex finder
  - calculation of bness without vertex found
  - pi0 attachment
  - lepton information?
- add vertex charge / LCFI interplay / PID interplay

BeamCal Reconstruction

- makes only sense when considering pair background
- up to now: full simulation overlay of pair background only for dedicated studies (FCal)
- physics samples use parametrised efficiency
  - very old (pre-LOI) function of:
    - energy of high-energetic electron/photon
    - local background density where HE e/gamma hits BeamCal surface
- significant progress in full BeamCalReco
  => how to make availble in physics studies?
  => more from Andre today!

TruthStuff & DST Format

- TruthColourSingletJetFinder:
  - works on std whizard n-fermion samples
  - not yet on Higgs samples (different MCParticle structure)
- RecoMCTruthLink:
  - verify that ok with Mokka & Geant 4.10.x
- TruthVertexFinder:
  - has been committed by Sviatoslav, many thanks!
  - test pi0 attachment?
- DST: What should be added / removed wrt DBD?

Conclusions

- HLRecoWS @ DESY, July 6-10
- there's a lot of progress in various areas
- need to collect this and make it work together
- preparations have started
- Wednesday schedule:
  - June 17: ILD Optimisation
  - June 24: sw/ana
  - July 1: final HLRecoWS preparation? – tbd
  - July 6-10: WS
  - July 15: EPS rehearsals - tbd

Backup

Remote Participation

- character of meeting not well suited for general "broadcast"
- but fuze can of course be arranged for
  - talks (mornings/late afternoons)
  - specific discussions (upon request)
- but beware that schedule we be kept flexible!

DST Format – To Do

- keep "canonical" PandoraFO collection
- in addition
  - BeamCalPFOs
  - GarlicPhotons
  - Pi0 using Garlic / ….
  - Taus using algoA / algoB /….

JetFinder

- Marcel: provide default steering
- Junping: Global Jet Clustering using Georgi Algorithm
- => release code, provide example / standard steering