Software Wrap Up

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Outline

- Core Software and Simulation

- Grid Production Tools

- Digitizers

- Track Reconstruction

- High Level Reconstruction

- Particle Flow Reconstruction

- Summary Outlook

Core Software and Simulation

- **ilcsoft**: branch into v01-19-xx and v01-17-xx/v01-18
  - decouple finalization of new software chain (Root6,c++11,DDRec) and improvements to HLR tools

- **Whizard2** in preparation, for detector optimization can also use existing DBD samples

- **DD4hep** in good shape - basically feature complete

- **ddsim**: rather complete and ready to be used
  - well documented configuration parameters (command line, steering file)

- **ILD_o1(2)_v05** simulation model is complete and needs validation by Sub detector R&D experts
  - will be nominated by sub detector groups
- need to implement Ecal options with scintillators

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Grid Production Tools

- iLCDirac in good shape

  – maintained for LC community by CLICdp

  – can now run new DD4hep based jobs (from cvmfs)

- grid production for ILD

  – running successfully for ILD (DBD like) production

  – preparations to run new (DD4hep) based jobs

  – major issue:

  – need to find someone to take over the Monte Carlo production for ILD !

Digitizers

- track digitizers are basically parameterized smearing
  - simple gaussian for Si-Trackers, from t-beam for TPC
  - missing: more realistic TPCDigitizer taking module boundaries into account
  - question: do we need also more realistic Si-Digitizers ?

- calorimeter digitizers (Si, Sci) are rather realistic and validated against t-beam results
  - plans to re-factor them into a more modular way for the new software chain
  - SDHcal digitizer will be ported to DDRec
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Track Reconstruction

- new track reconstruction using the DDRec::Surfaces is working in principle

- issues:
  - pull distributions are not yet 'perfect'
    - material description ?, fitting code (strips?), space point builders ?
  - tracking efficiency in forward region still worse than for DBD
  - pattern recognition tools still use Gear

- will address all issues in v01-19-xx
- → work for the next weeks

High Level Reconstruction Tools

- many improvements in FlavorTagging
  - Adaptive Vertex Finding, Vertex Mass recovery, pi0 ,...
  - code needs to implemented in LCFIPlus
    - requires finalization of PID tools

- improvements of likelihood PID (using dE,dX, shower shapes) are ongoing
  - aiming for a release in ~1-2 months

- note: these tools are independent of the branch in ilcsoft - they work in both worlds

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Particle Flow Calorimeter Reconstruction

–   PandoraPFA for LC is in very good shape

  - recent activities: improved photon finding, detailed studies on JER performance (cell sizes, #layers,...)
  - ongoing: understand application of software compensation

–   DDMarlinPandora is in place for running Pandora in new software chain

  - works for ILD and CLICdp

–   Arbor v3: alternative PFA ?

  - investigating the possibility of using track reconstruction in calorimeter
  - complete event reconstruction in preparation
  - alternative implementation exists in Pandora
  - $\rightarrow$ can the two be merged ?

Summary and Outlook

- very good progress in all fields of event processing
- core tools and simulation tools in good shape

- need detailed validation of simulation models
  - and add missing sub detector implementations (Ecal options)
  - need list of sub detector software experts
- work needed on track reconstruction and HLR

- will compile status learned at this workshop into a large spreadsheet
- use this to develop workplan and possibly a timeline
  - timeline of course depends on individual progress and peoples availabilty

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