Short Report from the Software Coordinator

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ILD Software and Analysis Meeting
September 14, 2016

Outline

- Recent Activities and Plans
  - Generator
  - Simulation
  - Reconstruction
  - Monte Carlo Production
- iLCSoft releases
- Summary

Main Goal for next months

- prepare the software and computing tools for large scale Monte Carlo production for further ILD detector optimization in preparation of the update document to the TDR
  - using the newly developed software chain with:
    - DBD-like ILD model and
    - new small ILD model
      → talk by Ties in last ILD Phone Meeting
  - large SM and BSM data samples for ongoing and future physics analyses

- started by gathering information on status and open issues of software and computing tools
  - validation of new DD4hep based software chain
  - finalization and validation of new reconstruction chain for old (DBD) and new sim.
  - eventually information should be accessible centrally to everyone in the ILD Wiki-page :

https://confluence.desy.de/display/ILD/ILD+Software+Working+Group

Generator Group

J.Tian, M.Berggren

- ongoing activities:
- in contact with WHIZARD 2 authors addressing known issues:
  - particle multiplicities different in 4 jet events wrt. Whizard 1.9
  - ISR energy spectrum in 2 jet events (radiative return peak has moved by ~few GeV)
  - H->tau,tau issues in decays via Tauola (H->tautau is new feature in WHIZARD2)

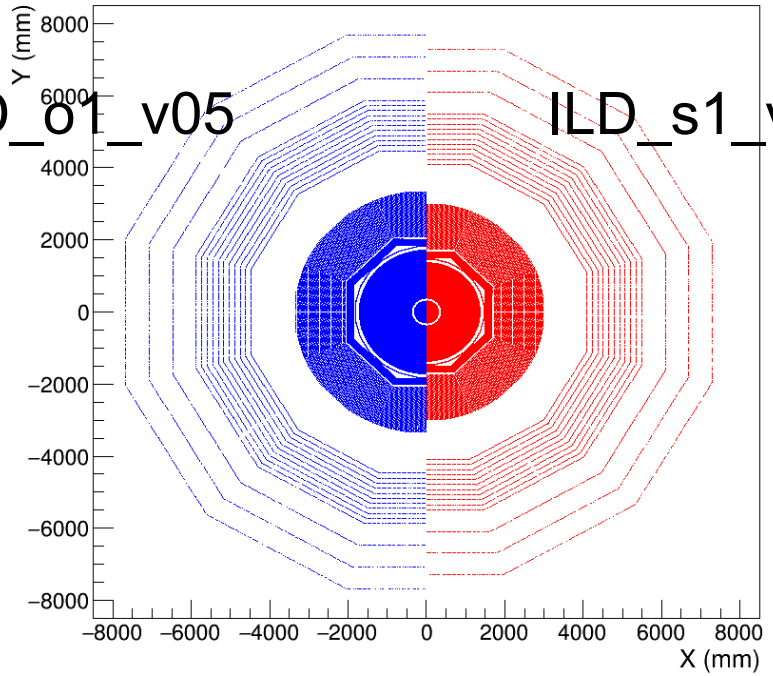
- latest WHIZARD release 2.3.1 (Aug. 25, 2016)

  => need detailed tests and iteration on issues

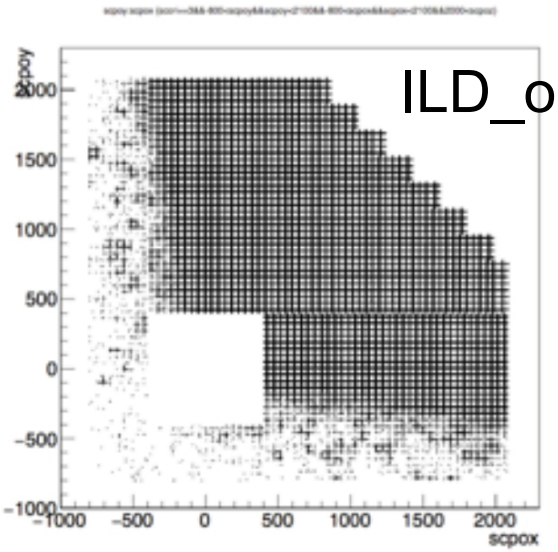
Simulation Group

D.Jeans, Sh.Lu

ILD_o1_v05 ILD_s1_v01



ILD_o3_v05



- created documentation and tools for validation of simulation models
- implemented (radial) scaling behavior for ILD simulation model (SL) and first version of small ILD model: **ILD_s1_v01**
- implemented **SciEcal** in DD4hep/lcgeo (K.Kotera): ILD_o3_v05
- iterate with technical groups (via software contacts) on details of new simulation models
- => all models need iteration and validation

ILD sub-detector contacts

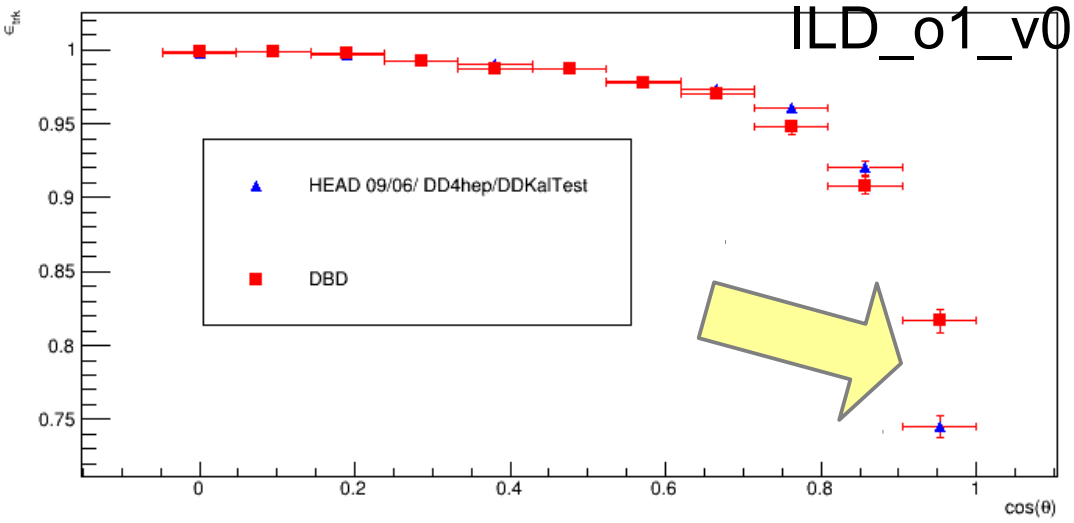
group	name	detectors/systems
Calo	Daniel Jeans	Ecal, Hcal
Si-Tracker	Marcel Vos	SIT, SET, FTD
VFS	Bogdan Pawlik	beamCal, LCal, LHCal
Yoke	Nicola d'Ascenzo	Muon, Coil
MDI	Karsten Buesser	beam pipe, cables, services
TPC	???	TPC

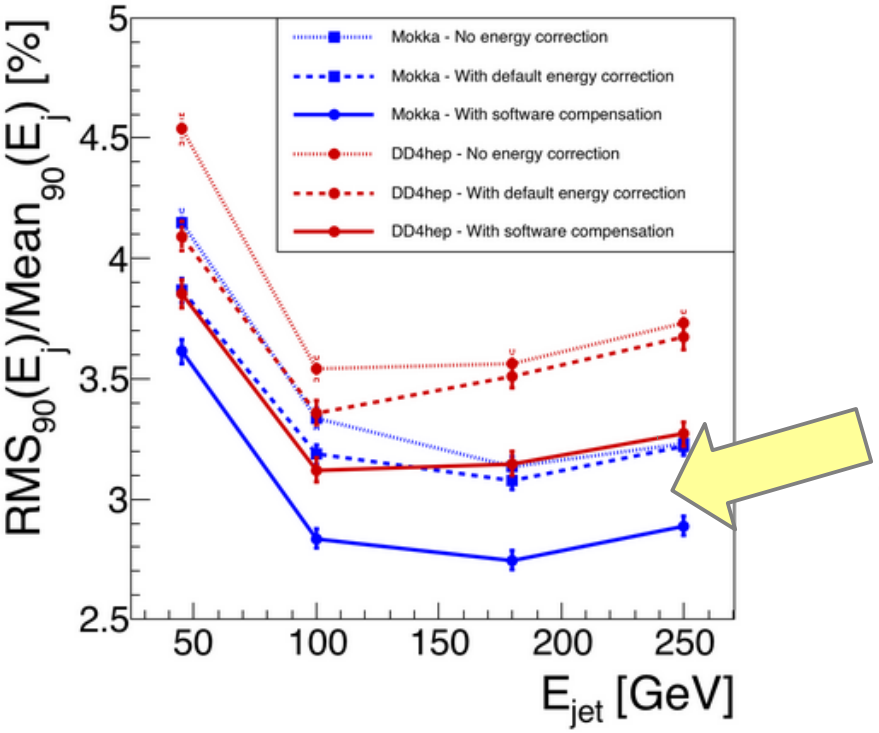
- almost all software contact persons are in place now
- they will play an important role in
  - validating the simulation models
    - geometry parameters and materials
  - validating the digitization (and reconstruction)
    - realism of the digitizers
    - expected resolutions/performance
- in collaboration with Software Working Group

Reconstruction Group

L.Tran, Y.Voutsinas

- created documentation and tools for validation of reconstruction performance (→ see confluence page) :
- re-reconstruction of DBD simulated samples
  - works rather well (in v01-17-10)
- configuring, testing and validating the reconstruction for the new simulation models is ongoing
  - issues currently under investigation





MC Production Group

A.Miyamoto, H.Ono

- preparing the infrastructure for (large scale) Monte Carlo productions on the Grid using iLCDirac

- AM and HO got started w/ learning and exercising the new system
- received MC requests:
  - 500GeV H->mumu - w/ DBD version **DONE**
  - 500 GeV 4f w/ DBD version **DONE**
  - 500 GeV 6f-ttbar sample - w/ DBD sim & new reco → need v01-17-10 !
- web page for new samples:

  https://confluence.desy.de/display/ILD/Monte+Carlo+Production

- started to develop procedure for next big mass production
  - currently too much manual interference and 'baby sitting' required

- KEK-SE now accessible again after upgrade of KEK-CC

iLCSoft release v01-17-10

- released iLCSoft v01-17-10 in 1. week of August
  - progress in tracking, PFA and HLR for DBD re-reconstruction
  - starting point for validation of the new ILD simulation models
  - SL6 gcc4.4 and gcc4.8
  - last legacy release (up to patches)

- started to prepare patch release v01-17-10.p01
  - LCFIPlus: needs patch to ROOT for change in TMVA (normalization)
  - CED: wrong version included
  - MarlinTrkProcessors: improvement in MiniVectorCA based patrec
  - Overlay: missed some recent code in release tag
  - MarlinKinfit: ongoing development for improved fitting with track objects
  - PandoraPFA: new path release with bug fix available
  - anything else ?

future iLCSoft releases

- started to move into the new world:
  - using **C++11** in the code
  - requires gcc4.8 and higher only
  - ROOT6 (requires C++11)
  - (partly) move the iLCSoft packages to **github**
    - started with DD4hep this week
  - phase out old (Mokka based) code and packages
  - create the software chain for the ILD MC mass production
    - cannot expect all code to be backward compatible

- transition period ahead might cause some minor inconveniences and confusions

  => expect users/developers to KEEP CALM and Learn Git

Summary and Outlook

- the Software Working Group has re-started its work after the summer break with addressing the main goal for next months

  prepare the software and computing tools for large scale Monte Carlo production for further ILD detector optimization in preparation of the update document to the TDR

- gathering documentation and tools for the SW validation and monitoring process - follow at:

  https://confluence.desy.de/display/ILD/ILD+Software+Working+Group

- preparing patch iLCSoft release v01-17-10.p01
- started the transition to the new iLCSoft (C++11, DD4hep, ROOT6, Git,...)
- continue the finalization and validation of the new software chain and models in communication with technical groups
  - need to get the sub-detector software contacts involved

- need to find replacement for Yorgos, who is going to leave for new tasks