

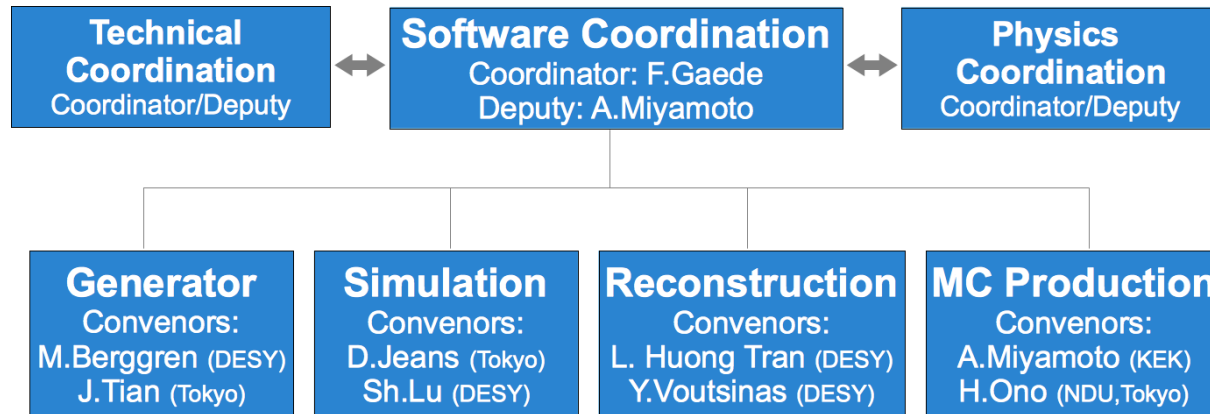
# Report from the Software Coordinator

Frank Gaede, DESY  
ILD Meeting  
July 20, 2016

# Outline

- Software Working Group activities since Santander
  - Generator
  - Simulation
  - Reconstruction
  - Monte Carlo Production
- Preparing for Production
- iLCSoft releases
- Summary

# ILD Software Convenors



- ILD Software Convenors have started their work right after formal approval by IA
- focusing on the **preparation of the next large Monte Carlo Production for ILD**
- bi-weekly phone Meetings (alternating w/ ILD SW&Ana Meetings)
  - discuss recent progress and plans for the next weeks
  - also technical software topics
  - four meetings since Santander workshop

# 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
  - 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>

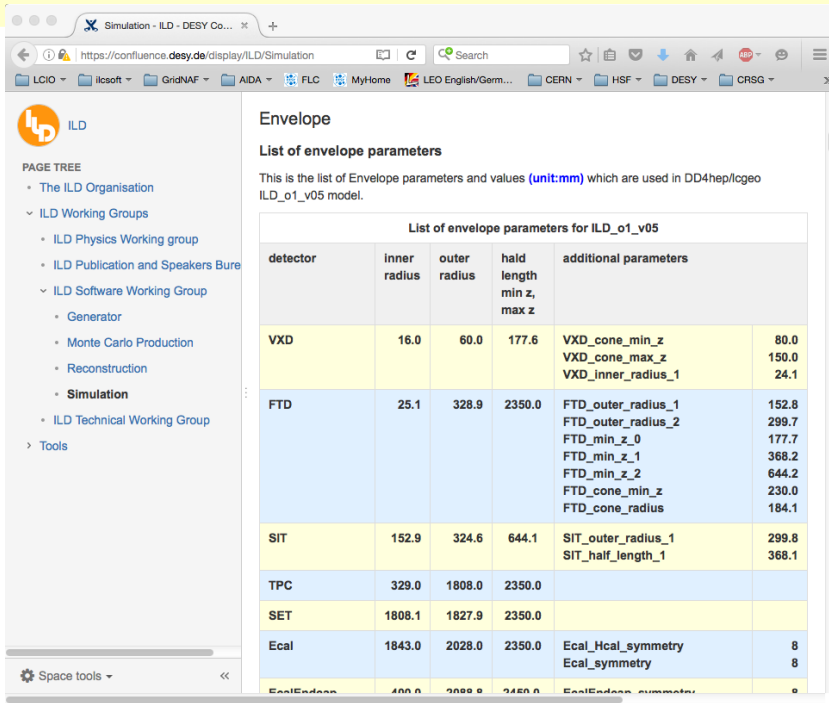
# Generator Group

J.Tian, M.Berggren

- preparing generators for use by ILC (Whizard2 and/or others)
  - MCParticle output, proper tune, interface to Pythia, Tauola,...
- recent 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)
- plan for release 2.3.2 for this summer
  - => need detailed tests and iteration on issues once this is out !
- JT joined LC generator group
- collaborating with CLICdp ( facing almost the same issues)

# Simulation Group

D.Jeans, Sh.Lu

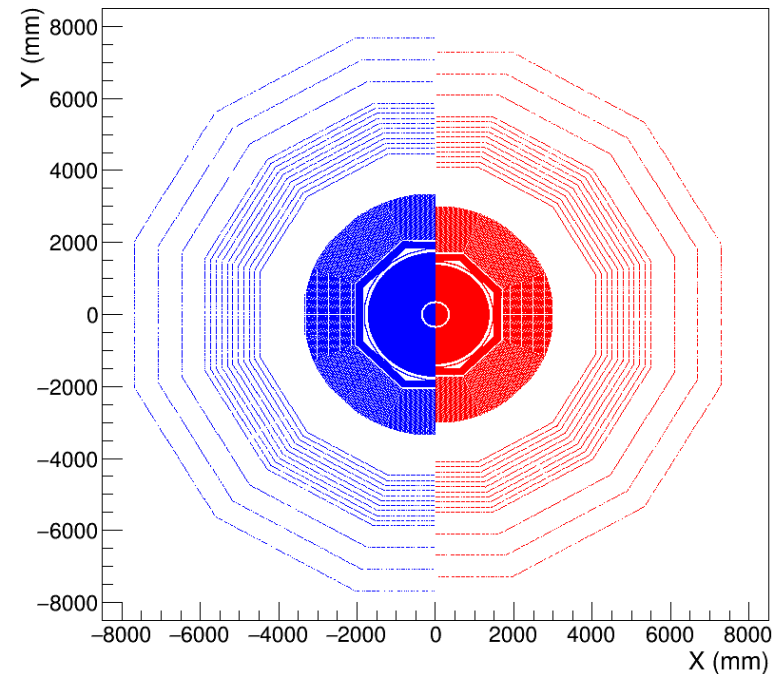


Envelope

List of envelope parameters

This is the list of Envelope parameters and values (unit:mm) which are used in DD4hep/loge0 ILD\_o1\_v05 model.

List of envelope parameters for ILD_o1_v05					
detector	inner radius	outer radius	half length min z, max z	additional parameters	
VXD	16.0	60.0	177.6	VXD_cone_min_z VXD_cone_max_z VXD_inner_radius_1	80.0 150.0 24.1
FTD	25.1	328.9	2350.0	FTD_outer_radius_1 FTD_outer_radius_2 FTD_min_z_0 FTD_min_z_1 FTD_min_z_2 FTD_cone_min_z FTD_cone_radius	152.8 299.7 177.7 368.2 644.2 230.0 184.1
SIT	152.9	324.6	644.1	SIT_outer_radius_1 SIT_half_length_1	299.8 368.1
TPC	329.0	1808.0	2350.0		
SET	1808.1	1827.9	2350.0		
Ecal	1843.0	2028.0	2350.0	Ecal_Hcal_symmetry Ecal_symmetry	8 8
EcalEndcap	400.0	2028.0	2450.0	EcalEndcap_symmetry	8



- create **documentation and tools for validation** of simulation models:  
<https://confluence.desy.de/display/ILD/Simulation>
- created new package validateSim (DJ) :
  - hit energy spectra, cellIDs
- implemented (radial) scaling behavior for ILD simulation model (SL)
  - started to create small ILD model
    - detailed parameters need to be adjusted as needed/required by ILD
    - need decision on **Hcal geometry** for simulation model soon

# Reconstruction Group

L. Tran, Y. Voutsinas

- create **documentation and tools for validation** of Reconstruction performance:

<https://confluence.desy.de/display/ILD/Reconstruction>

- re-reconstruction of DBD simulated samples
    - works rather nicely see recent talk by YV and plots on web page
  - reconstruction of ddsim samples (new models)
  - tracking performance, JER, PID performance, ....
- 
- recent activities
    - implemented the **new realistic calo digitizers** for new reconstruction (LT)
      - observe still issues w/ calibration
      - work in progress
    - finalizing the track steering for the re-reconstruction (YV)
    - preparing iLCSoft release v01-17-10
    - checking forward tracking in DD-Tracking

# MC Production Group

A.Miyamoto, H.Ono

- prepare the infrastructure for ( large scale ) Monte Carlo productions on the Grid
  - using the [iLCDirac](#) service (provided by CERN)
  - adjust the existing procedure to fulfill the needs of ILD
- 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
- announcement: KEK-SE will be inaccessible in August !



# 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
    - materials
  - validating the digitization ( and reconstruction )
    - realism of the digitizers
    - expected resolutions/performance
- in collaboration with Software Working Group

# iLCSoft releases

- preparing release iLCSoft [v01-17-10](#) ( 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)
- after the summer break we move into the new world:
  - gcc4.8 and higher only
  - using [C++11](#) in the code
  - (partly) move the iLCSoft packages to [github](#)
  - start to phase out old (Mokka based) code and packages
  - create the software chain for the ILD MC mass production

# Summary

- the Software Working Group has started its work 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

- quite some progress since Santander
- gathering documentation and tools for the SW validation and monitoring process - follow at:

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

- preparing iLCSoft release v01-17-10 now
- will then start to address the finalization and validation of the new software chain and models after the summer break
  - need to get the sub-detector software contacts involved then