Introduction and Overview

Frank Gaede, DESY
ILD Software and Optimization Workshop
DESY, Hamburg 22.-26 Feb. 2016

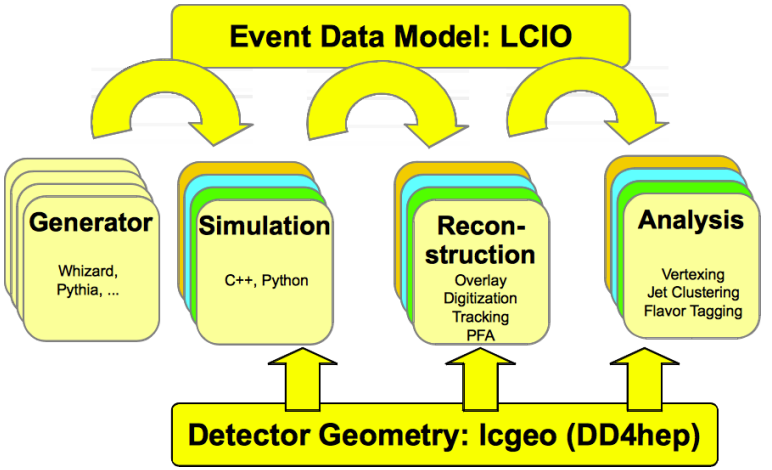
Outline

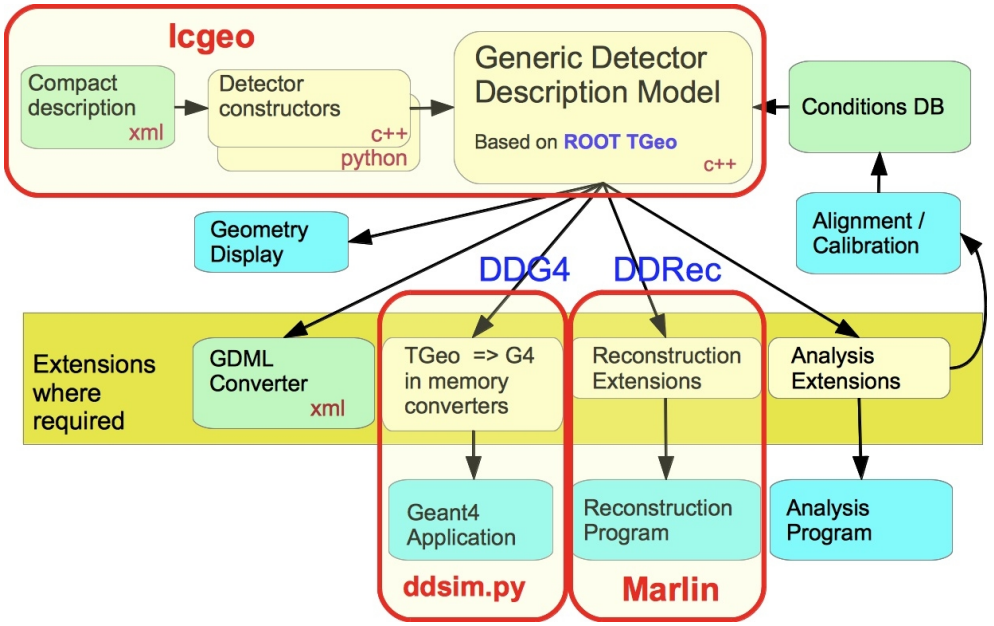
- brief introduction to new software chain
- software expert workshop Mon./Tue.
- plans for iLCSoft
- towards a roadmap for ILD optimization

New ILD (simulation) software

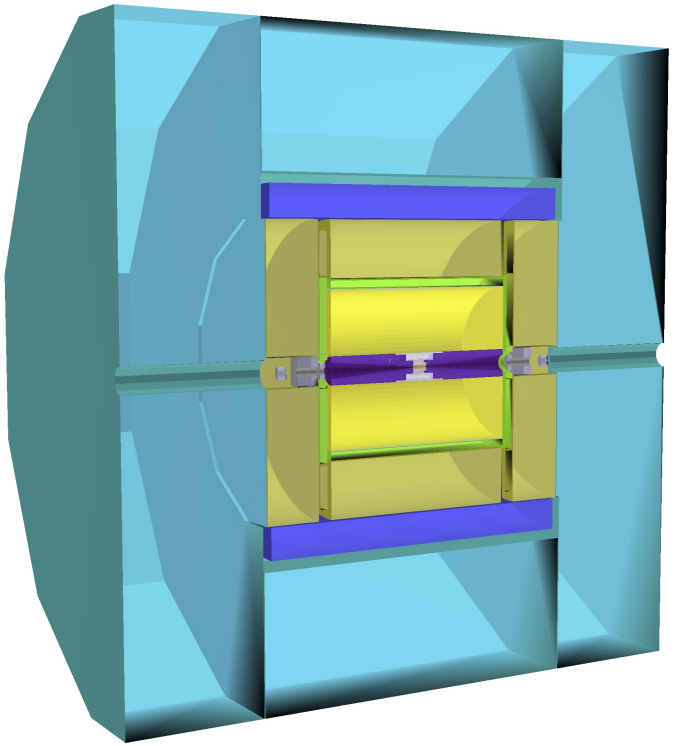
- LC community is moving towards more common software tools
- ILD decided to use the DD4hep geometry description and DDG4 for simulation
- DDRec is the interface for reconstruction
- same tools used by CLIC SiD !

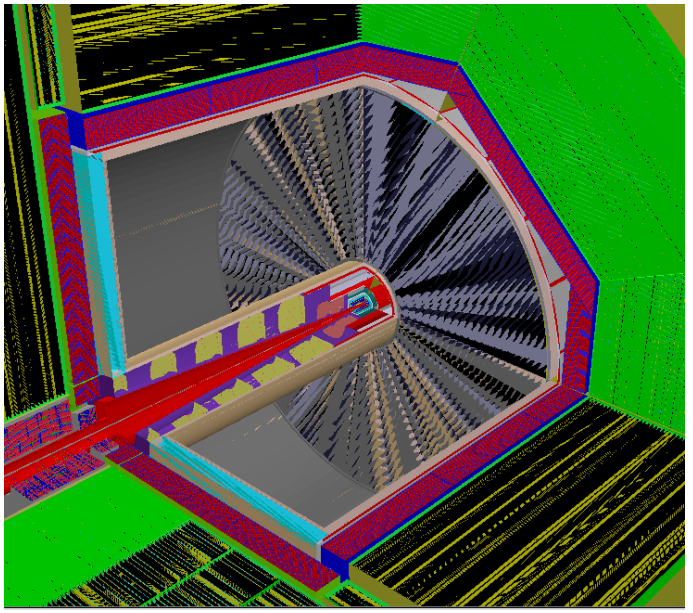
DDRec to replace GEAR





ILD simulation model in lcgeo (DD4hep)

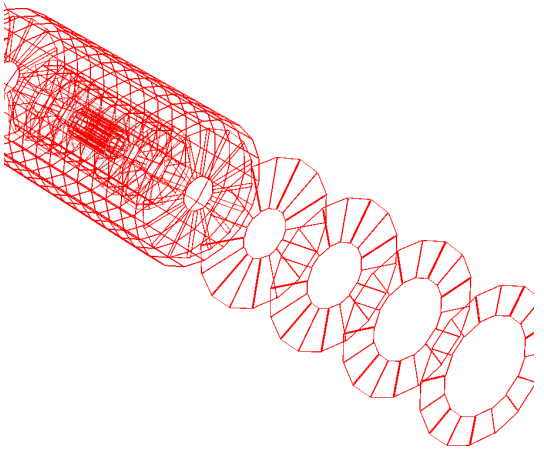




- ILD_o1_v05 Mokka DBD simulation - model ported one-to-one to DD4hep
- model is fully functional and ready for detailed validation
- ILD_o2_v05 (SDHcal) also exist

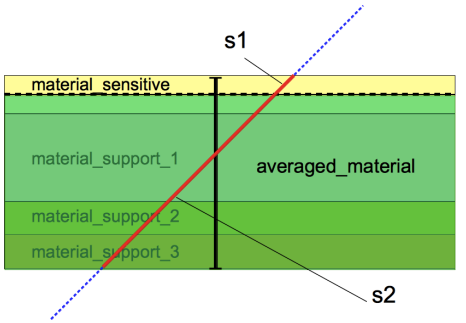
DDRec interface to geometry

- dedicated data structures for high level information
- surfaces for track reconstruction



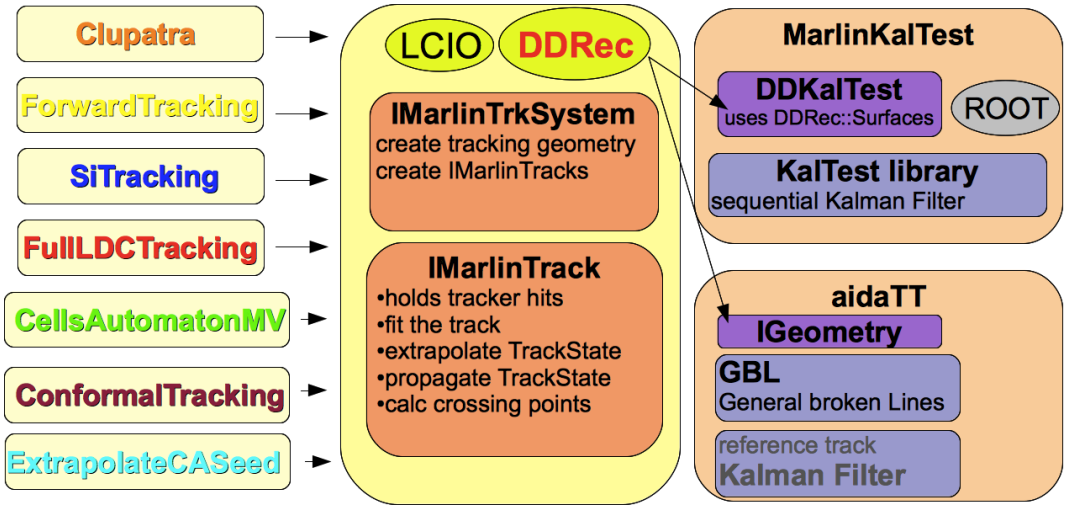
Data Structure	Detector Type	Example
ConicalSupportData	Cones and Tubes	BeamPipe
FixedPadSizeTPCData	Cylindrical TPC	TPC
LayeredCalorimeterData	Sandwich Calorimeters	ECal, HCal, fwd Calos
ZPlanarData	Planar Silicon Trackers	VXD, SIT, SET
ZDiskPetalsData	Forward Silicon Trackers	FTD

- can create GEAR file from these
  => possibility to run 'old' reconstruction with
  only minor adaptations

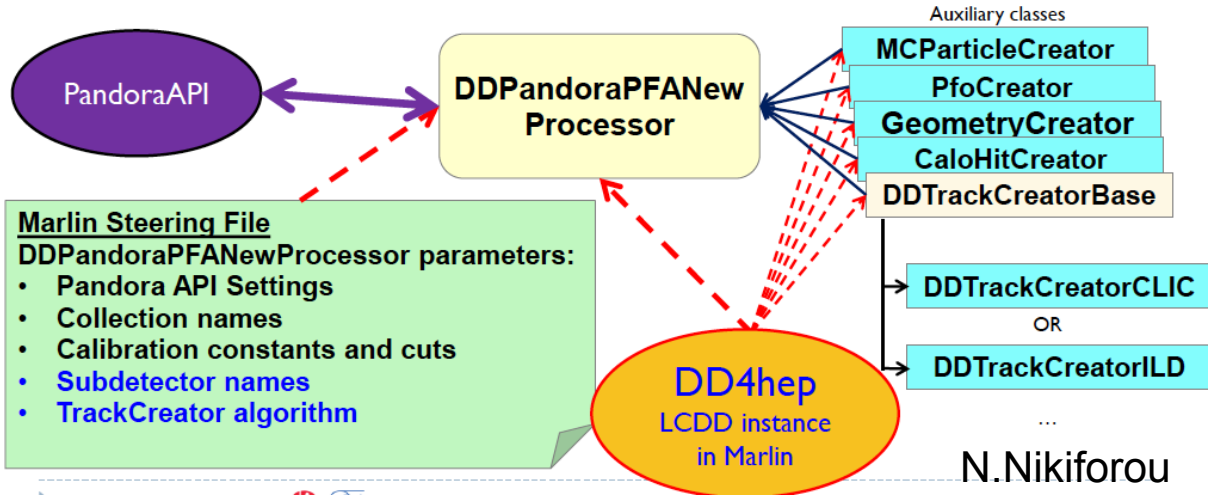


- adapted reconstruction code to work with DDRec:
  - DDKalTest, aidaTT for track reconstruction
  - DDMarlinPandora to run Pandora
  => can run 'new' reconstruction w/ DD4hep only

Reconstruction Tools for DD4hep



- MarlinTrk tracking tools are now fully compatible w/ DD4hep
- can run existing pattern recognition
  - aidaTT-GBL allows for alignment studies



- DDMarlinPandora rewrite of MarlinPandora using DD4hep
- can run Pandora as before

Software Expert Meeting Mon/Tue

Overview and Goals for Software expert meeting

SemR 4a, DESY Hamburg

DD4hep

SemR 4a, DESY Hamburg

iLCSoft releases

SemR 4a, DESY Hamburg

ILCDirac and Grid production

SemR 4a, DESY Hamburg

ddsim - lcgeo

SemR 4a, DESY Hamburg

Status and Verifcation of Simulation models

Tracker Digitization

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Status Track Reconstruction

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V0 Finder

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KinkFinder

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Introduction to running the new software chain

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Creating new detectors in lcgeo/DD4hep

SemR 4a, DESY Hamburg

DDMarlinPandora - DDCaloDigi status and validation

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Pandora Calibration

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Software Compensation and Gap correction

BAH1, DESY Hamburg

Pi0 Reconstruction

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Data Quality Monitoring for HEP

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PID Tools

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Vertex Charge

BAH 1, DESY Hamburg

Four-vector covariance matrix

BAH 1, DESY Hamburg

MCTruth Information

BAH 1, DESY Hamburg

standard reconstruction and DST format

BAH 1, DESY Hamburg

Software: Generators & Time for hands-on work

“summary” SW Expert Meeting

- reviewed the status of the complete new software chain and new HLR tools wrt. readiness for large scale Monte Carlo production
  - focused on ILD optimization, but also addressed common points with CLICdp and SiD
  - identified and discussed many open issues
  - and started addressing them and/or find people that will do so
- => will here about most of the topics today
- after the workshop: compile a detailed table with work items, people doing the work and time estimates
- this should eventually lead to a road map for the next large MC production for detector optimization

iLCSoft releases

- need to make three major transitions in LC software:
  - move to ROOT6, c++11 and replace Gear with DDRec in pattern recognition (digitizers and PFA already done) before starting the final testing and validation
- move to new set of developers releases v01-19-xx that break backward compatibility with reconstruction of DBD simulation
- in parallel development of HLR tools continues, based on current release v01-17-09
  - goal to eventually create one 'legacy' release v01-18 from this
- need to make sure that physics analyses can continue

Agenda for Today

Introduction and Overview	*Frank GAEDE*	
SemR 4, DESY Hamburg		09:00 - 09:20
Generator Status	*Akiya MIYAMOTO*	
SemR 4, DESY Hamburg		09:20 - 09:40
DD4hep Overview and Status	*Dr. Markus FRANK*	
SemR 4, DESY Hamburg		09:40 - 10:00
ddsim	*André SAILER*	
SemR 4, DESY Hamburg		10:00 - 10:20
ILD simulation model	*Dr. Shaojun (DESY) LU*	
SemR 4, DESY Hamburg		10:20 - 10:40
Coffee		
DESY Hamburg		10:40 - 11:10
Tracking Tools	*Georgios VOUTSINAS*	
SemR 4, DESY Hamburg		11:10 - 11:30
Flavor Tagging Tools	*Mr. Masakazu KURATA*	
SemR 4, DESY Hamburg		11:30 - 11:50
PID Tools	*Strahinja LUKIC*	
SemR 4, DESY Hamburg		11:50 - 12:10
ILCDirac	*Marko PETRIC*	
SemR 4, DESY Hamburg		12:10 - 12:25
ILD Grid production	*Dr. Constantino CALANCHA PAREDES*	
SemR 4, DESY Hamburg		12:25 - 12:40
Digitization	*Oskar HARTBRICH*	
SemR 4, DESY Hamburg		12:40 - 13:00

PandoraPFA and AHCal optimization	*Dr. John MARSHALL et al.*	
SemR 4, DESY Hamburg		14:00 - 14:30
DDMarlinPandora	*Mr. Nikiforos NIKIFOROU*	
SemR 4, DESY Hamburg		14:30 - 14:50
Arbor v3	*Bo LI*	
SemR 4, DESY Hamburg		14:50 - 15:10
PID with Arbor and Garlic	*Mrs. DAN YU*	
SemR 4, DESY Hamburg		15:10 - 15:30
Coffee		
DESY Hamburg		15:45 - 16:15
AMTF Visit		
DESY Hamburg		16:15 - 17:30
SiD Software and Optimization	*Dr. Jan STRUBE*	
SemR 4, DESY Hamburg		17:30 - 18:00
Software Wrap-Up & Discussion	*Frank GAEDE*	
SemR 4, DESY Hamburg		18:00 - 18:20

- rather busy agenda
- speakers need to stay in time (incl. discussion !)