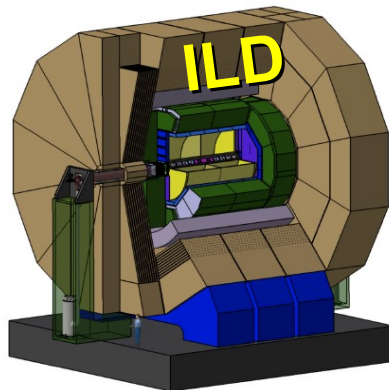


Software Status

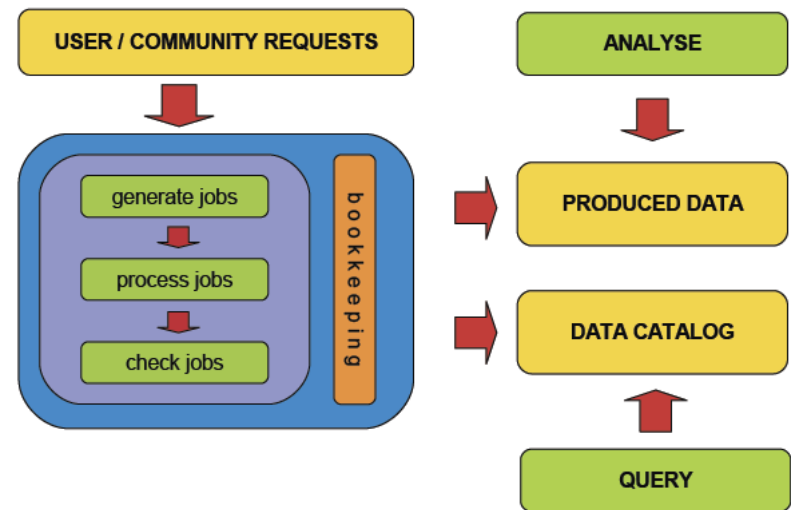
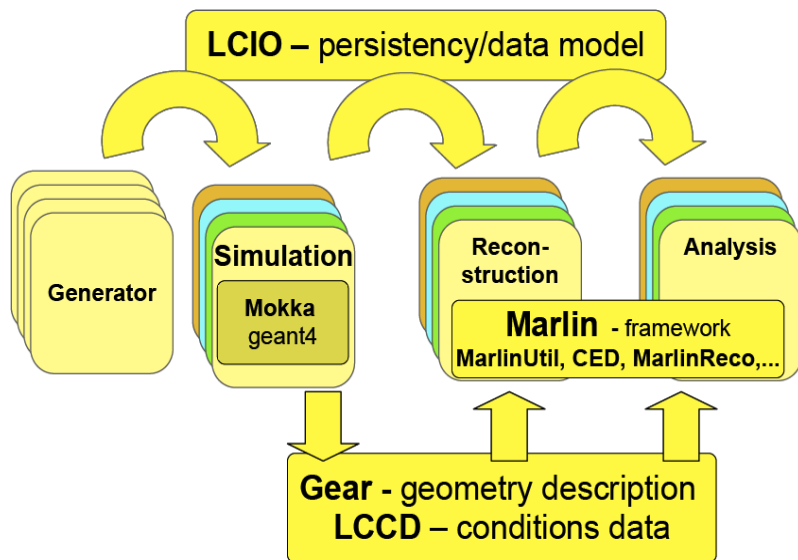
Frank Gaede
ILD-Meeting @ LCWS
2010 Beijing



- Core Software:
 - Grid production system
 - LCIOv2
 - Geometry System
- Simulation
 - increased realism in subdetectors
 - services !
- Reconstruction
 - PandoraPFA/LCFIVertex
 - new Tracking Code
- Timeline
 - new production

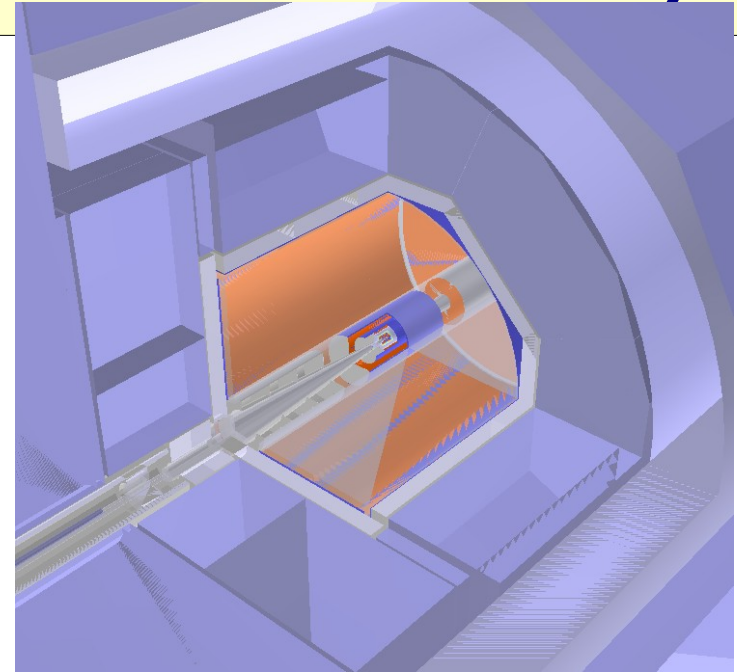
Monte Carlo production - Grid

- ILD has a complete software framework as used for the LOI mass production (v01-06)
- this can be used - as is - for any MC production:
 - physics analysis (350GeV, 1 TeV...)
 - further detector optimization
 - study of alternatives/options
 - background studies (partly)



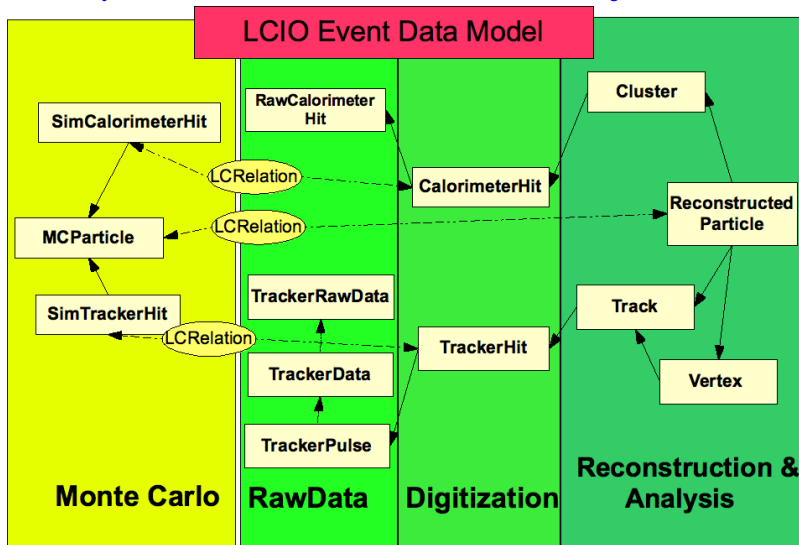
- a new Grid production system has been developed
 - incl. data catalog
 - collaborate with DIRAC @ LCD
- need **test case production**
 - e.g. 350 GeV with SB2009 !?
- Grid computing resources are available: DESY, in2p3, KEK, UK,...

Core software: LCIOv2 & Geometry



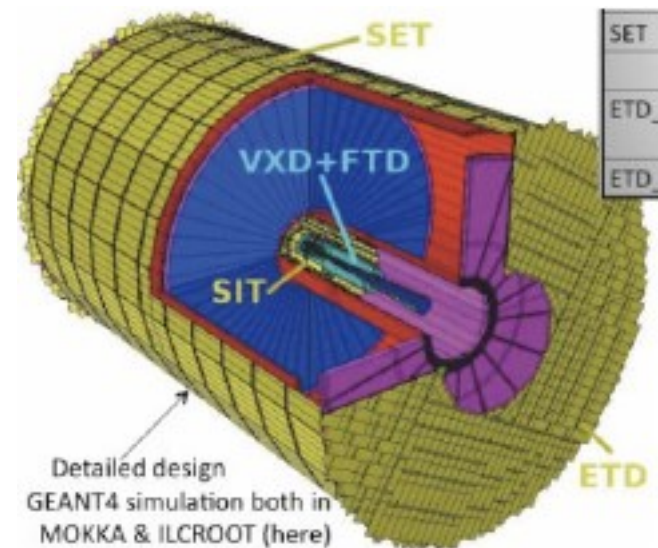
- LCIO provides persistency and hierarchical Event Data model
- used by ILD, SID, CLIC, R&D groups
- working towards **LCIOv2**:
 - direct access to events
 - partial reading of events
 - splitting of events over files
 - streaming of user classes (?)
 - use **LCIO** with **ROOT**
 - improving the event data model (1d,2d hits, tracks/trajectories)

- improvement of GEAR and Mokka geometry description is ongoing (LCD group)
- extend and improve Gear detector API
- use GDML & ROOT-TGeo:
 - access to **detailed material properties**
 - visualization & overlap checking
- if EU-fp7 project AIDA approved will have some effort for this

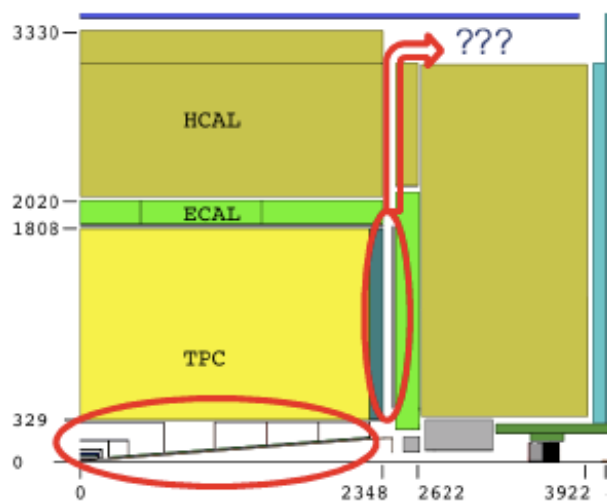


Improving the ILD simulation

- main tasks in improving simulation:
 - increased realism (some detectors)
 - add alternatives/options
- established list of Mokka sub-detector contacts (before Paris)
- asked contacts for plans of their R&D group wrt. software:
 - (for details talks A.Miyamoto LCWS, F.Gaede SWWG phone)
 - almost all contacts reported plans that aim at summer 2010
 - => should have software meeting !

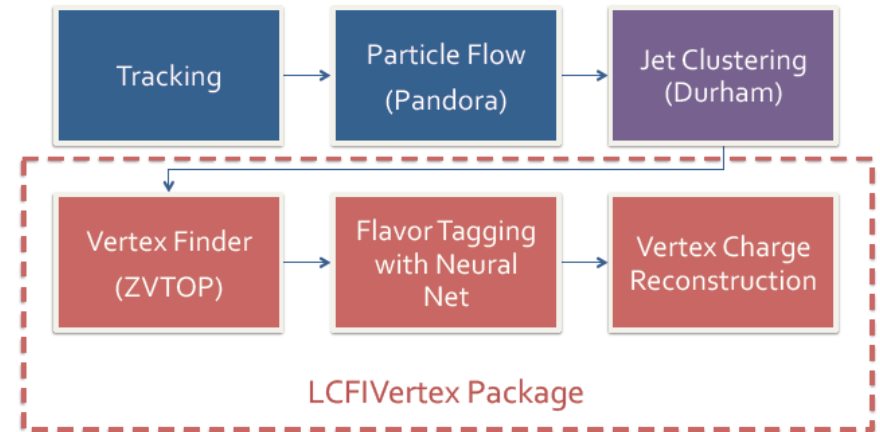


- by summer 2010 hope to have
 - improved realism of existing sub-detectors
 - complete set of alternatives implemented: FPCCD, DHCAL, sDHCAL, Sci/SiW Ecal,...
- yet to be addressed
 - services and cables
 - -> new integration working group

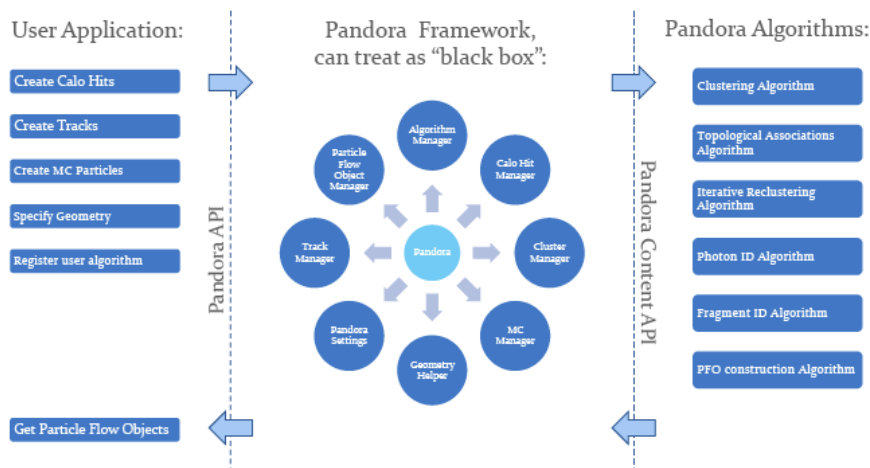


Reconstruction: PandoraPFO/LCFIVertex

- new PandoraPFA
- code restructured
- made framework independent
- re-implemented in Marlin
- improvements of algorithm on the way
- to be addressed:
 - algorithm tuning for alternative technologies:
 - dHcal, sDHcal, Sci/SiW Ecal



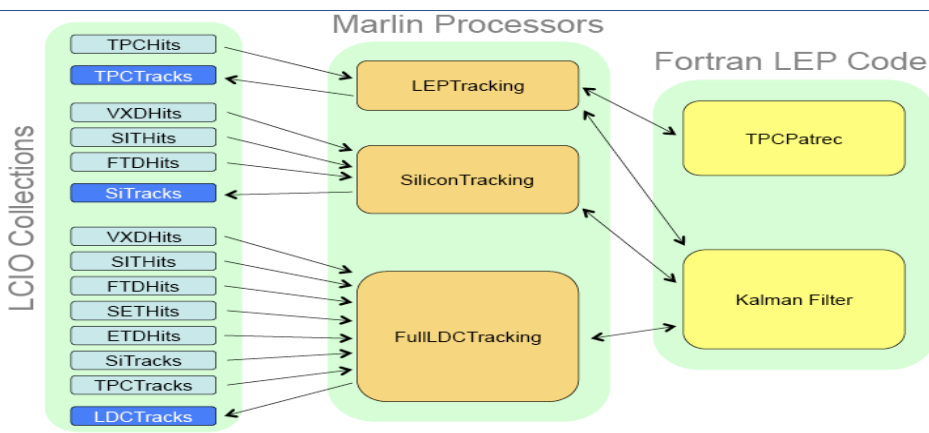
- LCFIVertex package now maintained by strong asian group
- improvements under development
 - kinematic variables, jet finding,...
- ongoing adaption to new software release(s)
- possibly to be addressed:
 - adaption to detector options in optimization studies



Reconstruction: Tracking

- current tracking worked for LOI - but revealed deficiencies:
 - f77 - software maintenance
 - forward tracking w. background
 - no treatment of strips (ghosts)
 - issues at 1-3 TeV
- goal: rewrite tracking - based on existing package:
 - ATLAS tracking
 - GenFit (TU Munich, Belle2)
 - KalTest (KEK, LCTPC)

- ATLAS tracking the most powerful, but
 - deeply coupled to ATLAS framework
 - support limited (for obvious reasons)
 - -> seriously look into other packages
 - dedicated session on monday...
- GenFit & KalTest are lightweight standalone track fitting packages:
 - both need pattern recognition
- Possible scenario:
 - develop standalone pat-rec for TPC
 - use existing pat-rec for VXD+SiTrk
 - have groups interested in tracking work on improving the silicon pat-rec and the forward tracking



- for this approach to be successful on a short timescale (which?) we have to very well coordinate the work and have all to commit to collaborate !

Summary & Outlook (Timeline)

- complete 'LOI' ILD framework exists !
- many developments ongoing in sw:
 - LCIOv2, geometry, Grid production
 - improvement of simulation
 - realism and options
 - improvements in reconstruction
 - newPandoraPFA, LCFIVertex
 - will start development of **new tracking package** (major effort!)

towards a Timeline for software

- expect many results in software by summer 2010
- -> plan to have software meeting
 - possibly wider scope !?
- in general there is **a lot to do** – so ideally we should allocate enough time for that !

5 month	Analysis and Writing	13 month
t0 - 5m	Monte Carlo production finished	
5 month	Grid Production	
t0 -10m	start Monte Carlo production	
3 month	Test, Debug and release ILDsoft	
t0-13m	freeze ILDsoft development	~20 month
>1 month	implement baseline in simulation	
t0-x	ILD baseline defined	
	evaluate technology options develop tracking package develop geometry LCIOv2	
	improve simulation realism improve reconstruction study machine backgrounds	

- -> would prefer a timeline that
- has any **major MC production as late as possible** (13 month before DBD)
- use time until then to
 - optimize detector
 - study options/alternatives
 - develop tools
- have 'optimal' detector for DBD incl. new results from R&D groups