




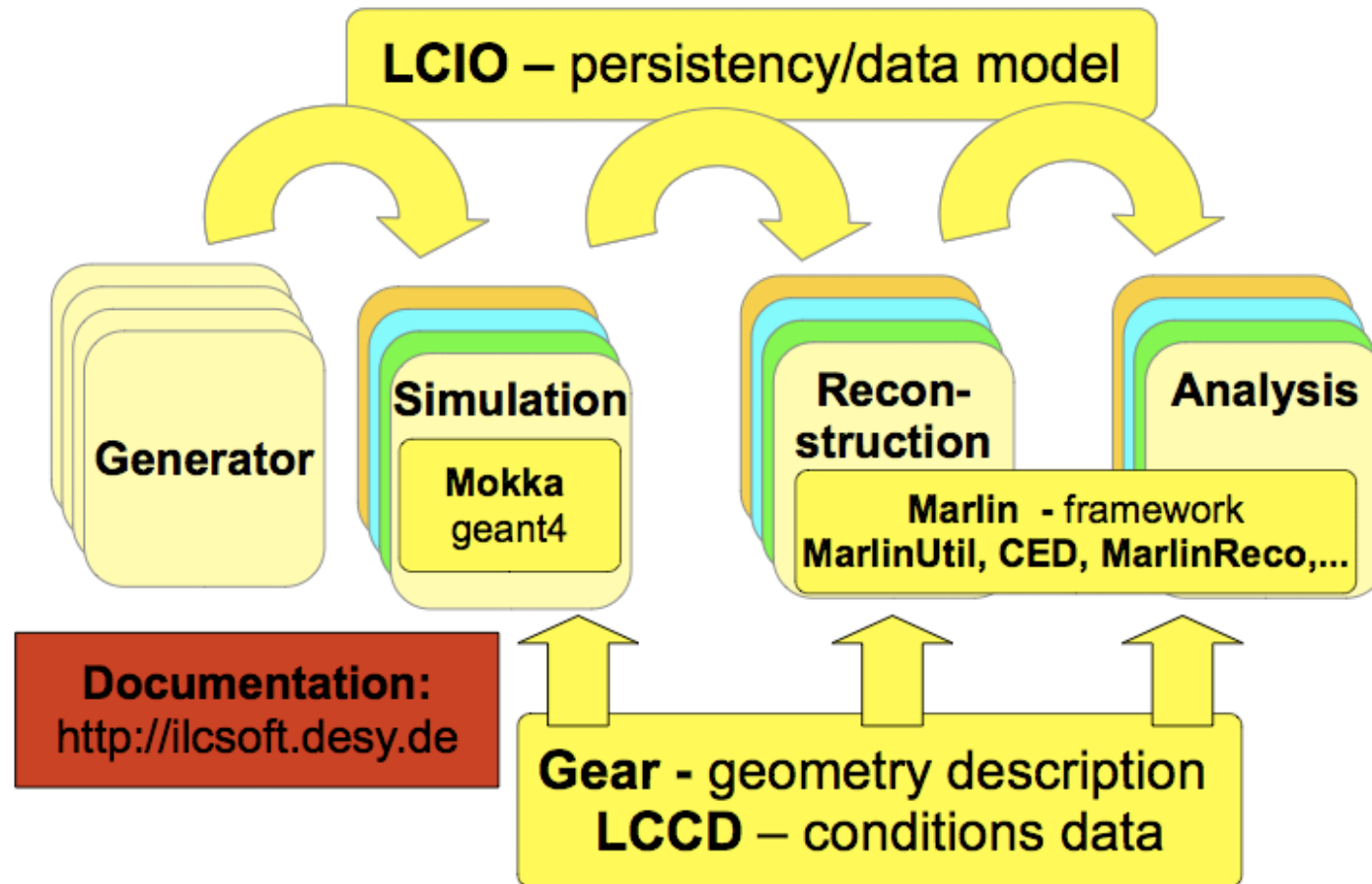
Status and Plans for Core Software Tools

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ILCSoft – Overview



Present Status

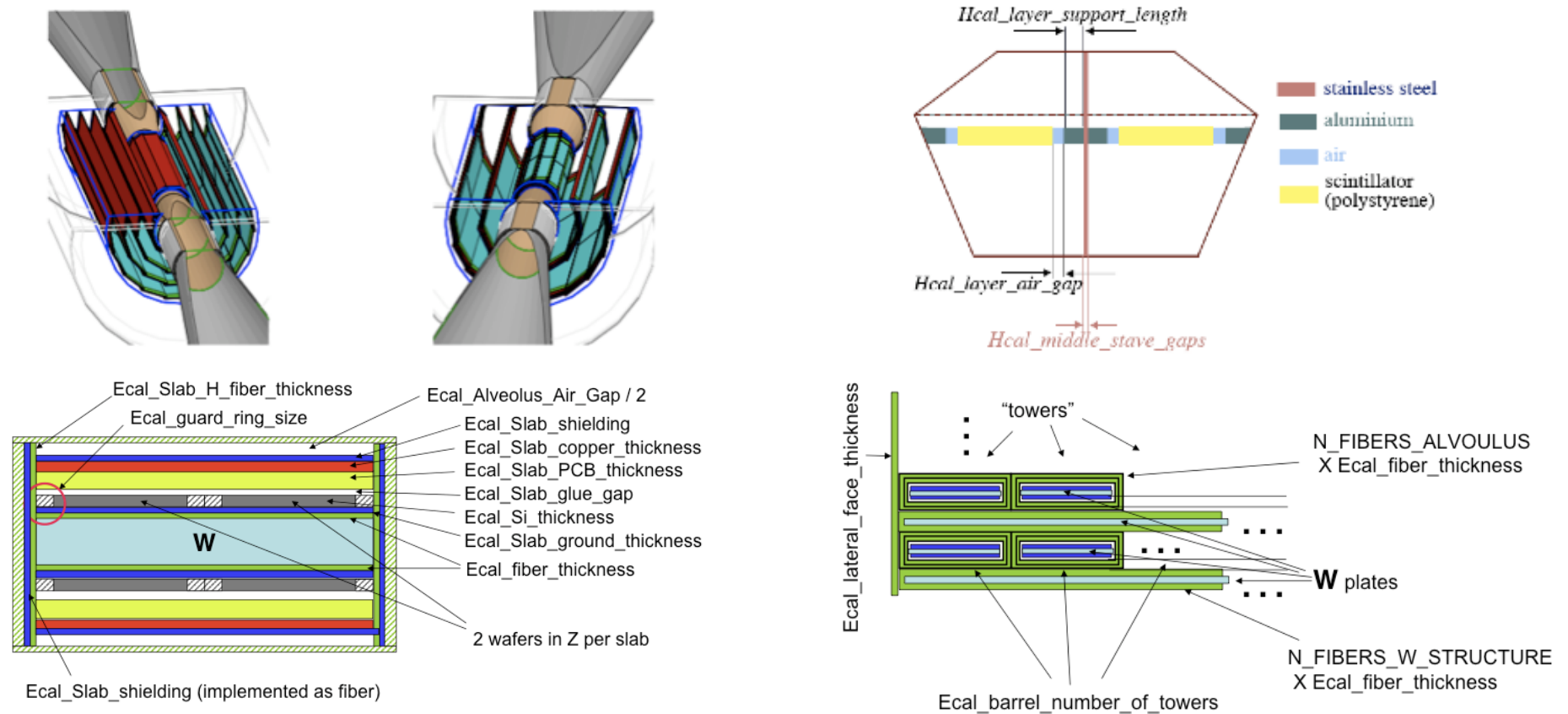
- First version of the common data analysis and simulation framework was completed after 21 months (2007)
- Continued support: feature development, bug fixing, etc.
- Last year spent working almost exclusively on LOI production and studies.
- The common data analysis and simulation framework was adopted for the ILD LOI studies with over 60 million events simulated and reconstructed (v01-06)

Move to SVN

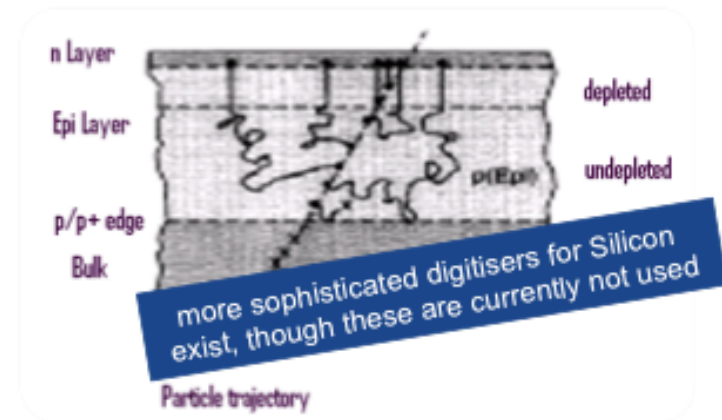
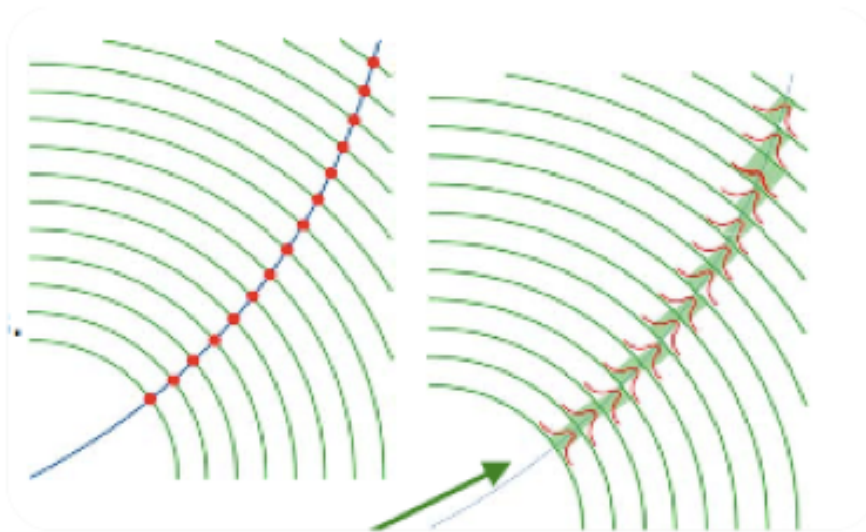
- Migrated the CVS repository holding ILCSoft held at DESY to SVN. The new SVN repository is also maintained by DESY.
- 3 different access methods, kerberos, grid-cert, and standard username – password
- Improved web interface.
- Moving to SVN helps increase our platform support
- MarlinTPC will be migrated to the DESY SVN repository in the near future

Mokka

A lot of effort made to increase the engineering detail for the LOI studies. This will need to be increased for the TDR, meaning that the continuation of the good support from the R+D communities is vital



Digitisation



	$\sigma_{r-\phi}/\mu\text{m}$	$\sigma_z/\mu\text{m}$		$\sigma_{r-\phi}/\mu\text{m}$	$\sigma_z/\mu\text{m}$
VTX	2.8	2.8	FTD	5.8	5.8
SIT/SET	7.0	50.0	ETD	7.0	7.0
TPC	$\sigma_{r\phi}^2 = 50^2 + 900^2 \sin^2 \phi + ((25^2/22) \times (4/B)^2 \sin \theta) z \mu\text{m}^2$ $\sigma_z^2 = 40^2 + 8^2 \times z \mu\text{m}^2$				

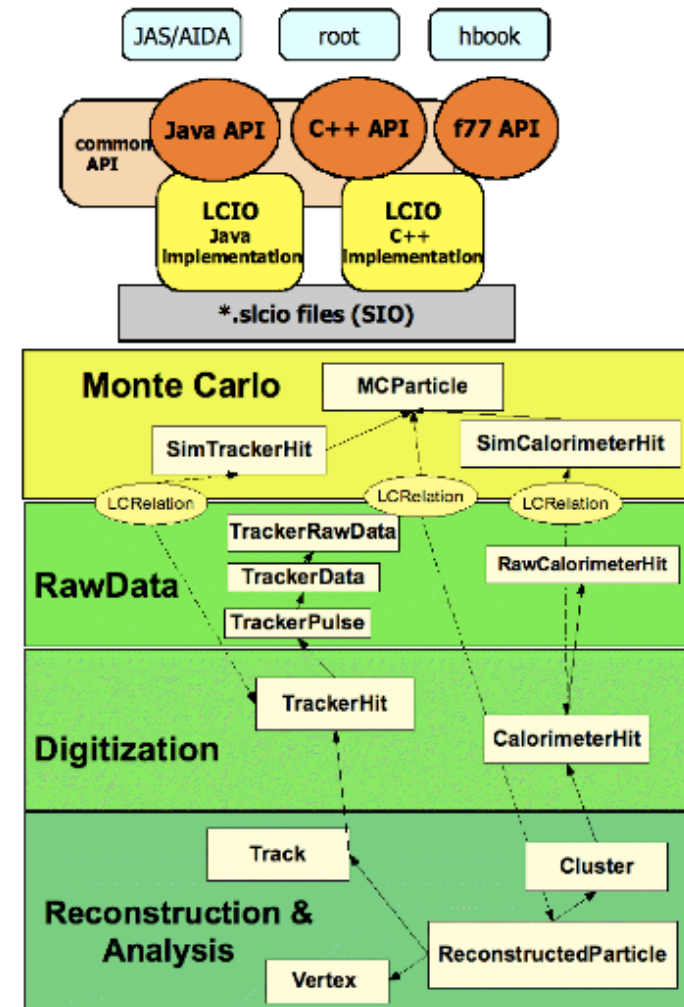
... are we going to need more sophisticated digitisation for the Calorimeters?

GEAR and LCCD

- Improvements to the interface for the description of a TPC Endplate Read-out Pad-plane, see presentation by Martin Killenberg
- Working on additional features requested by CALICE
- Considering replacing underlying CondDBMYSql with a more up to date DB e.g. COOL?

LCIO

- Joint DESY – SLAC Project
- Provides persistency (I/O) and an event data model (EDM) to ILC detector R&D community
 - object I/O (w/ pointer chasing)
 - schema evolution
 - compressed records
 - hierarchical data model
 - decoupled from I/O by interfaces C++, Java (and Fortran)
 - some generic user object I/O
- Used by ILD, SID, CALICE, EUPixelTelescope, LCTPC



LCIOv2?

- further improve LCIO -> LCIOv2?
- event data model
 - 1d, 2d hits
 - Track class – multiple fits per track
- Improve I/O
 - splitting of files
 - direct access
 - partial reading of events
- Investigate the use of ROOT with LCIO
 - LCEvent in ROOT macros
 - look into optional ROOT I/O for LCIO

Important to continue successful horizontal collaboration with
SID on LCIO

LCIO I/O

- started to investigate optional ROOT I/O for LCIO
- created dictionary with rootcint for LCIO classes
 - thanks to ROOT team for their help and for adding some features to ROOT 5.24.00 needed for LCIO
- write and read LCEvents transparently to/from ROOT files
 - no change in user code
- use LCEvents in ROOT macros
 - rapid development of analysis code based with LCIO in ROOT
- issues:
 - no branches due to pointers between object
 - no partial reading and splitting of events over files
 - need proper interface to ROOT I/O for java implementation

ILCInstall & ILCSoft Grid Installations

- Added Simtools Modules from JSF Framework (Akiya Miyamoto)
- Improved support for OSX
- Added SVN support
- Still maintaining ILCSoft Grid installations over a good number of sites, added a couple new sites in '09

CE	SW-VER	SW-OS	DATE	TIME	SYS	SE	SAM	JOB	TAGGED	HIST-LOGS
cdccgcell01.in2p3.fr	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
cdccgcell02.in2p3.fr	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
ce.bfg.uni-freiburg.de	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
ce.gllte.ecdf.ed.ac.uk	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
ce01.dur.scotgrid.ac.uk	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
ce01.tier2.hep.manchester.ac.uk	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
fal-pygrid-18.lancs.ac.uk	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
grid-ce3.desy.de	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
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lcpce02.gridpp.rl.ac.uk	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
polgrid1.in2p3.fr	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History
svr021.gla.scotgrid.ac.uk	v01-04	sl4	2008-09-25	15-14-43	OK	OK	OK	OK	VO-Ilc-Ilcsoft-v01-03-06-s14 VO-Ilc-Ilcsoft-v01-04-s14	History

if you need ilcsoft on your site – let us know

New Production System

- During the LOI Mass MC production we were able to utilise a vast number of resources
- Unfortunately this also consumed a lot of manpower resources
- Work is ongoing to produce a system which is able to efficiently utilise such resources
- See talk by Jan Engels in this session

Automated Test System

- Experience from the mass production also pointed towards the need for an automated test system beyond the current nightly build system.
- Such a system should eventually incorporate unit tests, integration tests, as well as higher levels test at the level of physics output.
- Need to be pragmatic and look around at existing instances, as manpower is quite limited. One suggestion is to look at OVAL which has been developed for CMS

FP7 – AIDA – on behalf of F. Gaede

- WP2 – Common Software
- Develop core software tools that are useful for the HEP community at large and in particular for the next big planned projects: sLHC and Linear Collider (ILC/CLIC)
- Make efficient use of the available funding by keeping the number of partners at a reasonable level
- Focus on two major tasks
 - development of a generic HEP geometry toolkit (Task 2)
 - development of detector independent reconstruction tools (Task 3)(n.b. Task 1 is the WP coordination)

WP2 – Task2 – Geo Toolkit

Develop geometry toolkit with the following features:

- description of complex shapes, materials and sensitive detectors
- interfaces to
 - full simulation programs (geant4, fluka?), fast sim ?
 - reconstruction algorithms:
 - high level interface a la GEAR
 - (questions that need to be answered during reconstruction (tracking and clustering/PFA)
 - also to JAVA (org.lcsim)
 - visualization tools (OpenGL, ROOT, VRML,...)

WP2 – Task2 – Geo Toolkit

Develop geometry toolkit with the following features:

- allow for misalignment of detector components
- interface to conditions database
(alignment, calibration)
- efficient tracking in geometry hierarchy and field
- ...
- as discussed at the LC Software Meeting in May at CERN

WP2 – Task3 – Reco Toolkit

- Detector independent reconstruction toolkit:
- tracking and vertexing toolkit with state of the art algorithms
 - Kalman Fitters, Gaussian Sum Filters, ...
- generic particle flow algorithm
 - based on a modularized version of PandoraPFA
- alignment tools
- this task is closely related to TASK1, in particular the 'high level' interface will have to be well designed, such that one can write these algorithms in a truly detector independent way