



# **Software Common Task Group Report**

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**ALCPG09**

**30 September 2009**

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# Charge and Members

- **Charge**

- **Coordinate tools and data bases common to LOI groups and code compatibility for simulation studies.**
- **Work on any common software issues for ILC detector studies**

- **Members**

- **Re-organization in progress after IDAG validation**
- **Members:**
  - Akiya Miyamoto(Convener)
  - Norman Graf(Deputy Convener)
  - Frank Gaede
  - (to be filled)

- **LOI era:**
  - **Contacts to make MC data samples for benchmark processes common to all LOI groups.**
- **After LOI submission**
  - **Meetings: 2 WebEx , 1 face-to-face (yesterday ), E-mail communications**
  - **Start to discuss plans until 2012.**
  - **Set up a web page for our activities**
  - **LC software workshop (May 28-29) @ CERN**

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## Detector Common Task Working Group - Software

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### Introduction

ILC Software Common Task Working Group is one of [Common Task Working Groups for ILC Physics and Detectors](#). It has been organized since autumn 2008.

The initial **charge of the group** is to coordinate common tools, common data bases and code compatibility for simulation. It is also anticipated that the activity of this group covers all software related issues for ILC detectors and work together where possible to promote R&D activities.

The activity of the group is reported to [Physics and Experimental Board](#) which is held regularly monthly interval.

### Presentations related to the WG activities

- [Report at the PAC meeting in Vancouver, 10 May 2009](#)
- [Software Common Task Group Report at TILC09, 20 April 2009, Norman Graf](#)

### Links to relevant pages

- [Common data samples for LOI studies](#)
  - [Standard model and signal data samples at SLAC FTP site](#)
  - [ILC data samples those used by ILD and others used for the ILD optimization](#)
  - [ILC beam parameters](#)
- [Software tools](#)
  - [Linear Collider Simulation Software \(http://lcsim.org/soft\)](http://lcsim.org/soft)
  - [International Linear Collider space on SLAC's Confluence Wiki](#)
  - [ILCSoft portal site](#)
  - [IlcRoot](#)



# LC Software Workshop @ CERN

- **Organization**
  - by CLIC software community to discuss software issues common to ILC
  - 27 participants from CLIC, ILD, SiD and 4<sup>th</sup>
- **Topics is selected CLIC community's point of view**
  - **Persistency: StdHep/HepMC, LCIO**
  - **data model: LCIOV2**
  - **Java  $\leftrightarrow$  C++ interfacing**
  - **Geometry tools: Gear, GDML, TGeo, Visualization**
  - **Common PFA**
  - **SW-Packaging, Virtualization, common Framework**

<http://indico.cern.ch/conferenceDisplay.py?confId=58717>



# CERN Workshop Conclusion

- **High Priority:**
  - evaluate ROOT I/O option for LCIO
  - PFA, modularized and common to LC community
  - LCIO data model extension: 1D/2D TrackerHits, multiple fit parameterization
- **Medium high :**
  - **Common geometry system: Ideal to have a geometry system**
    - both for simulation and reconstruction
    - shared by LC community
- **Medium**
  - **HepMC: binary format should be defined**

- **Sharing of tools and cooperation in tool developments are crucial for our study.**
- **Example: Success of LCIO**
  - **Common data model and IO**
    - Sharing of reconstruction tools : PFA, Vertexing
    - LDC + GLD → ILD
  - *We would like to continue using LCIO*

- **Topics at CERN LCSoft WS is not all. Ex.**
  - **Vertexing,**
  - **Tracking,**
  - **Shower Simulation,**
  - **Beam test tools**

Discussions at this WS are good opportunity to exchange activities and identify possible area of cooperation.

Soft CTG are pleased to work as liaisons of cooperation



# Work Plan until 2012 by RD

## Guideline for the Plan of the detector groups

1. Continue R&Ds on critical components to demonstrate proof of principle
2. Define a feasible baseline design  
(Options may also be considered. But one of them should be proven to be feasible.)
3. Complete basic mechanical integration of the baseline design accounting for insensitive zone  
(such as support structure, pipes, power lines etc.)
4. Develop a realistic simulation model of the baseline design, including faults and limitations

# Work Plan until 2012 by RD (cont.)

5. **Develop a push-pull mechanism working with relevant groups**

6. **Develop a realistic concept of integration with the accelerator including the IR design**

5&6: with GDE's BDS group through the MDI group

7. **Simulate and analyze benchmark reactions, which can be updated**

8. **Simulate and analyze some reactions at 1 TeV, including realistic higher energy backgrounds demonstrating the detector performance.**

8&9: Based on the work of the Physics Group and Software group.

The reaction will be chosen to show the strength of ILC compared to other facilities.



# Common sample: Beam Backgrounds

- **Samples for Strawman Design SB2009**
  - **Common background samples should be prepared for detector studies.**
  - **500 GeV parameter is available**
    - Traveling focus simulation: CAIN not yet. Guniea-Pig OK.
    - But beam energy spread: final word not available yet
    - Parameters for another energy points (250 GeV ) not yet.
  - **Hope that beam background samples are prepared soon after ALCPG09, for studies to give inputs to AD&I meeting in December.**
- **Samples for another energy points (1TeV, ... ) will be after LCWS10@beijing**



# Common Data Samples

- **Common data samples have been useful for LOI studies.**
  - **We thank SLAC colleagues for this work.**
  - **Common samples have been useful to understand differences in performance**
  - **Note that samples used by SiD and ILD were not completely exact.**
    - SiD used pre-mixed samples
    - ILD used un-mixed samples
    - For the moment, no significant problem is recognized.
  - **Current samples will be kept as they are in ftp server**

- **Large production of samples will be done after**
  - **Determination of machine parameters**
  - **Physics Common Task group's decision.**
  - **Generator updates on, such as**
    - inclusions of all top decay modes
    - tau polarization in decay other than tau-pair process
    - Whizard may not be optimal for Bhabha, gamma-gamma, SUSY with long cascade, ...
    - ...
    - ← Co-work with Physics CTG necessary
  - ***Load sharing of the production of generator samples needs to be considered.***

# Milestones (Draft)

- **Soon after ALCPG09 : Background samples of 'SB2009' ready**
- **( By Dec.2-3: Studies of SB2009 for feed back to GDE )**
- **LCWS2010, Mar. 2010**
  - **list of benchmarks ready ( from Physics CTG )**
  - **Machine parameter fixed**
- **~ June 2010**
  - **Updates of generator complete and start production of generator files.**
  - **Tools for generators should be ready by then**
- **By the end of 2010:**
  - **Generator files are available of simulations.**
- **Simulations for DBD**
  - **It will take ~ 1 year.**
  - **Expected to start by mid. 2011 or early 2012 ( No solid plans yet )**
  - **Common tools for Sim/Rec should be updated by then**

- **Software Common Task group has been organized to work on**
  - **Common data samples**
  - **Common software tools and standards**
- **Sharing of samples and tools are encouraged and important for studies towards Detailed Baseline Design.**