

# **ILD software workshop discussion and wrap-up**

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# detector R&D plan for DBD 2012

## 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

- in getting the software ready for the DBD 2012 we need to address pts. 4. and 7./8. of RDs roadmap !
- ILD software groups also has made plans for software !

## Guideline (cont'ed)

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.

slide with plans shown at last ILD meeting in Albuquerque 09/2009:

## Plans for ILD software

- at Cambridge decided to move towards common ILD software framework – developed plans in
  - (bi)weekly ild-sw-mgmt meetings
  - dedicated ILD software workshop in Tsukuba 2009
  - bi-weekly software WG meetings:
    - merge goodies from JSF into framework
    - develop a test system
    - develop new GRID production system
    - improve the geometry description
    - improve the reconstruction (tracking & PFA)
    - develop LCIOv2
    - improve the simulation
- almost all planned topics are addressed already (test system to follow soon)
- man power is critical

# timeline for ILD software development

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	
	...	

13 months prior to hand in of DBD are **fixed**

t0 will be end of 2012  
 -> have 20 month for software development

-> this is less than it looks, given the large number of topics to be addressed  
 -> **need priorities !**  
 -> **questions to ILD**

# simulation

- what level of realism is needed for DBD 2012 ?
  - services and dead material
  - level of realism currently quite different for various detectors
- -> should be answered by R&D groups and ILD
  - already taking on responsibility for simulation !
- what is the main goal for the simulation software in the DBD phase ?
  - very realistic description of the ILD detector vs. flexible and scalable model for optimization studies ?
- what kind of physics studies should be done with the various technology options ?
- how does ILD define the one model for DBD mass production ?

# reconstruction

- LCFIVertex now maintained by strong Japanese groups
- PandoraPFA re-structured in more modular, detector independent way
- tracking:
  - need new (C++) modern tracking package
    - for non-homogeneous field, backgrounds, ...
  - started to evaluate ATLAS tracking code
    - some work to be done -> decide by March 2010 if tbc.
  - re-writing the tracking is a major effort - we need to very well define which functionality we need when !
- the type of studies that ILD wants to do will have a major impact on the priorities

# core tools

- LCIOv2 on its way
  - ROOT interface (dictionary), improved I/O, ...
- geometry toolkit
  - first steps towards a new, more consistent and powerful geometry system started by LCD/CERN group
  - will have impact on most existing software tools !
  - need further iteration with involved experts
- new Grid production system under development
  - needed for next central MC production
  - sufficient Grid computing resource for ILC should be available !
- event displays
  - at least two available DRUID, CED, ....

# next software workshop

- should we have an ILD software workshop in early summer ?
  - could have it at DESY
  - 2-3 days ?
  - invite other concepts/groups
- probably only makes sense if we have identified some goals and milestones for that time
- otherwise there is the ECFA workshop in October



- thanks for a very interesting workshop
- to everyone for attending and very fruitful discussions
- to the speakers to prepare the talks
  - partly on rather short notice
- Paulo for perfect organization and hosting the workshop !