IDAG Report

Michel Davier
LAL-Orsay

LCWS10, March 26 - 30 2010, Beijing

The new role of IDAG

- LOI validation completed in 2009
- First IDAG meeting since validation of ILD and SiD concepts
- ILCSC asked IDAG to continue advising RD in the next phase through 2012
- RD request to monitor progress of concept groups toward detailed baseline design (DBD) and of common task groups (CTG)

IDAG agenda in Beijing

- Discussion with RD: monitoring, DBD
- ILD status
- SiD status
- Physics CTG: new benchmarks for DBD
- MDI CTG: progress report on push-pull
- Discussion and recommendations

General Remarks (1)

- extremely important to stick to the 2012 date for the DBD report
- coincident with the machine TDR.
- full ILC case available when first LHC results could reveal evidence for new physics phenomena
- limited resources: more important to adapt the contents of the report and keep the schedule.

General Remarks (2)

- scope and audience of DBD report should be more clearly defined
- 2009 LOIs are already very comprehensive documents
- information should be updated and clear baseline designs presented with options
- physics performance part needs to be revisited and enlarged: fully document the ILC physics case as demonstrated with realistic detector designs
- no ILD-SiD competition anymore
- desirable to elaborate on the complementary aspects.

General Remarks (3)

- costing of detectors is an important aspect
- common methods should be used (should mimic those of GDE for the machine, hence a value estimate for M&S and FTE counts for in-house labor)
- common unit costs, uncertainties and learning curves for industrialization.
- RD should find a way to ensuring this commonality: common costing group, costing tsar
- costing must be good enough that the collaborations can establish a ceiling which is not exceeded in later iterations.

IDAG Operation

- monitoring ILD/SiD progress done at two levels
- at each ILC workshop: hear reports and discuss with ILD/SiD in closed sessions
- monitor CTGs activity: cross view of situation, appreciate level of cooperation toward solving common problems.

ILD and SiD Review (1)

- making good progress on subdetector R&D
- serious shortcomings in funding
- ILD carrying more options and alternates than SiD (no problem in view of the ILC timeline) ability to capitalize on future developments (vertex detectors, calorimeter readout)
- software systems well developed (LOI benchmark studies), but different frameworks used by ILD and SiD, makes exchange more cumbersome.

ILD and SiD Review (2)

- lack of engineering support for system integration, design of support structures
- more acute for SiD
- very important to verify that desired goals for material budgets, power dissipation, dead zones, etc. can be met. Ex. Performance of the complex PFA algorithms
- some willingness to help solve some of the engineering support problems from the CERN DG together with major labs.

ILD/SiD and CLIC Detector

- detector concepts developed for CLIC based on ILD and SiD
- good collaboration between CLIC and ILC detector groups on the ground
- common problems that do not need independent solutions
- solutions of problems that require particular attention in CLIC could migrate to ILC -- for example the push-pull methods and vertex detector technologies that allow fast time stamping
- CLIC and ILC both need benchmark simulations at 1 TeV
- similar system integration engineering requirements
- more coordination of CLIC and ILC detector activities would be useful to allow more manpower to be applied to both
- joint working group recently established is a good step

Physics Benchmarks (1)

- LOI benchmark studies generally showed that the proposed detectors can approach the performance suggested by previous MC studies
- new studies that can inform on detector performance in areas not previously tested should however be done However we
- IDAG favours keeping the list of required new benchmarks relatively small, since the collaborations have major work to do on R&D, optimization and integration
- part of the identified manpower shortfall is in young physicists who would carry out the benchmark studies.

Physics Benchmarks (2)

- detectors should demonstrate that they can operate without major modification at 1 TeV
- Is magnet and calorimetry as designed for 500 GeV adequate?
- benchmarks probing essential topics at 1 TeV
- list provided (Nov. 2009) by Physics CTG too exhaustive and beyond the capability of the concept groups
- Physics CTG should identify only two processes to illustrate in a convincing way the 1-TeV case (as soon as possible)
- suggestion #1 from IDAG: ttbar H study to probe physics with a high multiplicity of jets
- suggestion #2: ee → WW process, involving the forward detection of jet pairs with rather small opening angles.
- revisit (simplified analysis) determination of Higgs couplings at both the ZH peak cross section and 350 GeV: verify the ability to do this key ILC measurement and quantify the tradeoff for running at different energies.

Machine Detector Interface

- heard nice progress from the MDI CTG
- work greatly simplified since LOI validation
- differences between ILD and SiD push-pull schemes well identified: detector heights, supports, motion, and interface with accelerator
- program of studies underway to resolve these issues on scientific ground
- finite element results on vibrations, supplemented by real measurements: platform vs. rolling legs question
- RD should keep close contact with these studies to assure that there is convergence on this issue so that GDE can define the machine detector interface.
- MDI guidance document should evolve into MDI specification document with more specific engineering boundary conditions for the concept groups to abide by
- MDI group should set up a specific deadline for circulating such a document.

Next IDAG Meeting

- Geneva/CERN, Oct. 2010
- ILD/SiD review
- Report expected from CTG on detector R&D
- Detector R&D review

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