IDAG Report

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Charge of IDAG

- Letters of Intent (LOI) called by ILCSC for detectors at ILC, in order to conduct technical design for optimized detectors to be included in the overall project in 2012
- Submitted LOIs have to be ‘validated’ regarding their performances and feasibility, as well as the capability of the submitting group to conduct detailed technical studies
- IDAG appointed to perform the validation process and advise the Research Director

IDAG Criteria for LOI Validation

- Are the physics aims of the detector convincing for an experiment at ILC?
- Is the detector concept suited and powerful enough for the desired physics aims and the expected accelerator environment?
- Is the detector feasible? Namely, is the required R&D for the selected technologies advancing fast enough to be completed during the design phase?
- Do the mechanism for push-pull operation and related alignment and calibration methods enable the desired switching process
- Are the estimated cost and the way to obtain it reasonable at the time of the LOI
- Is the group powerful enough to accomplish the required design work through the technical design phase?

IDAG in 2008

- March 2008: 3 EOIs received (ILD, SiD, 4th)
- June 2008, first IDAG meeting (Warsaw)
  - open presentations
  - separate closed discussions with groups
  - discussion with RD about mandate
- Nov. 2008, second meeting (Chicago)
  - open presentations
  - separate closed discussion with groups
  - set up organization for LOI evaluation

IDAG in 2009

- 4 preparatory phone meetings
- LOIs received 31 March 2009 (ILD, SiD, 4^{th})
- 17-21 April 2009, third IDAG meeting at TILC09 Tsukuba
  - open LOI presentations: detector, benchmarking
  - closed sessions with LOI representatives
- Fourth intermediate meeting in Orsay 19-21 June 2009
  - closed sessions with LOI representatives
- September 2009, fifth meeting at ALCPG workshop (Albuquerque)
  - delivery of validation report

Review Organization

- ’vertical’ reviews by subject with one convener (all projects studied)

- ‘horizontal’ reviews by project with one referee (all aspects included)

	Benchmarking		Tracking	Calorimetry	MDI
ILD	Hewett	Li	Nickerson	Green	Himel
SiD	Grosjean	Palestini	Danilov	Karlen	Toge
4th	Godbole	Grannis	Elsen	Kobayashi	Kim

Validation Schedule

- LOIs received March 31
- IDAG phone meeting on April 14
- 5-6 questions asked to each concept for fast feedback in Tsukuba
- Open presentations on April 17
- Separate interviews on April 18 (1.5 hr each)
- Common interview on benchmarking (1.5h)
- More questions/clarifications asked
- Follow-on interviews on June 19 (+20?)
- Decision in September

Next step

- Second set of questions
  - common questions focused on 2
    - important issues and benchmarking
  - + questions specific to each concept
  - + questions on MDI deferred by 2 weeks
- Answers requested for June 12
- Final interviews June 19 (Orsay)
  - need only 2-3 representatives/concept

Common questions (1): calorimeter calibration

Give an outline of the plan for calibrating the energy response of your calorimeter, both from test beams or monitoring signals and *in situ* running. What level of precision is required? How is it obtained ? How do you monitor and maintain it? If operation at the Z pole is part of your strategy, how much data is required?

Common questions (2): alignment

What is your plan for aligning your tracking systems. What is the precision required?

Are there special operations needed for alignment after push-pull prior to data taking, and what time is required? How many degrees of freedom need to be considered after a move? How do the alignment needs affect the design of your detector? Is any real-time monitoring of the tracker alignment envisioned (e.g., related to power pulsing and long term stability)?

Common questions (3): benchmarking

Repeat the recoil analysis with Z -> $\mu^+\mu^-$, e^+e^- , including the corrected ISR spectrum, and simulation of beam-background hits.

Specific questions

Will be given separately to each concept.

Conclusion

IDAG is appreciative of the large effort which went into delivering LOIs of high quality on the requested time scale.

To the best of its ability IDAG went through this impressive documentation in a relatively short time. Meetings in Tsukuba with the concept groups have been extremely useful and informative.

We have defined the scope of the next phase of evaluation before the June meeting where a final interaction with the groups will occur.

IDAG is on course to complete the validation process by September 2009.

IDAG Membership

• M. Danilov (ITEP, Russia)	exp	
• M. Davier (LAL-Orsay, France)	exp	Chair
• C. Grosjean (CERN)	th	
• E. Elsen (DESY, Germany)	acc	GDE
• P. Grannis (Stony Brook, US)	exp	
• R. Godbole (IIS, India)	th	
• D. Green (FNAL, US)	exp	
• J. A. Hewett (SLAC, US)	th	
• T. Himel (SLAC, US)	acc	GDE
• D. Karlen (Victoria, Canada)	exp	
• S. K. Kim (SNU, Korea)	exp	
• T. Kobayashi (ICEPP, Japan)	exp	
• W. G. Li (IHEP, China)	exp	
• R. Nickerson (Oxford, UK)	exp	
• S. Palestini (CERN, Italy)	exp	
• N. Toge (KEK, Japan)	acc	GDE

Expected LOI content

- Guidelines given by ILCSC
- More given by RD and IDAG
- About 100 pages + supporting documents

- Detector philosophy, sub-detectors and alternatives
- Evaluation of physics performances based on a common process benchmark list
- Integration issues with accelerator
- Status of a realistic detector model
- Identification of state, plans and timescale for required R&D and technological options
- Preliminary cost estimate
- Structure of group and capacity to carry out the work
- Resources needed as function of time for technical design

Expected LOI contents: final wording of IDAG additional requests

(1) Detector optimization: identification of the major parameters which drive the total detector cost and its sensitivity to variations of these parameters.
(2) Plans for getting the necessary R&D results to transform the design concept into a well-defined detector proposal.
(3) Conceptual design and implementation of the support structures and the dead zones in the detector simulation.
(4) Sensitivity of different detector components to machine background in the context of the beam parameter space considered in the RDR.
(5) Calibration and alignment schemes.
(6) Estimates of overall size, weight, and requirements for crane coverage and shielding.
(7) Push-pull ability with respect to technical aspects (assembly areas needed, detector transport and connections, time scale) and maintaining the detector performance for a stable and time-efficient operation.
(8) A statement about energy coverage, identifying the deterioration of the performance at energies up to 1 TeV and the consequent detector upgrades.