

Research Director's Report

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ILC Detectors: more news since last IDAG meeting

We have gained several helpful inputs from the new system of the International Detector Advisory Group (IDAG) monitoring global detectors after the validation. The IDAG report after the Beijing meeting suggests several [new measures](#). Even during the discussion, we already received several useful remarks, some of which were described in my last article. I wish to add one more, namely the nature of the detailed baseline design report which we are going to produce in 2012 to summarise the entire activity of the Detector Letter of Intent (LOI) process. There was a question as to whom the document will be addressed to. Formally such report should be given to International Linear Collider Steering Committee, the mother body of the entire ILC activities. But the report will go further and we need to think more precisely who may actually read it and what it should contain. The question further indicated that we need to share a common idea on the nature of the detailed baseline document.

The document will circulate widely when the ILC project is proposed to governments and funding agencies with the ILC's *Technical Design Report*. Its readers may include not only funding agencies but physicists of different expertise. Among them the most critical will be our colleagues who have a lot of experience, knowledge and are active in the related fields. We think that the document must be of a level which can convince these friends of the capability and feasibility of the experiments at ILC. I hope through the preparation of the report, we shall be even more confident ourselves, and can provide enough information to the accelerator colleagues. We are now considering which items should be contained in the report. The starting material is the already existing Letter of Intent, which covers most of the necessary topics. However, each item must be refined through continued studies, and a clear baseline should be defined and described in detail. The studies should include some level of engineering to show that the baseline detector is technically feasible and its expected performance is desirable.

For the above goal, limited resources required serious consideration. Under such situation, as one of the recommendations, IDAG picked out a few reactions from the new benchmark reactions, which were prepared by the physics common task group last November, to be simulated for the report with a higher priority. IDAG concluded this advice through the discussions with the representatives of the physics common task group, the detector groups and the software common task group where it was pointed out that the load is heavy to create simulation data for the new reactions. It also considered that several benchmark studies were made in the LOI preparation to a satisfactory level.

However, the new benchmarks were considered after the validation by the physics common task group from a different point than the LOI-time benchmarks. Namely they were selected to support the physics case for the ILC. Since the group made a comprehensive study of the possible reactions at ILC, and although our knowledge of the higher-energy phenomena is still very speculative, their careful study was needed knowing the suggestion of IDAG. I requested the group to revisit the question with the new constraint that there is resource limitation. The group recently proposed another set of new benchmarks with priorities indicated on them. The highly recommended reactions are somewhat different from what were suggested in the IDAG report. IDAG may have put more weight to demonstrate the performance of the detector. We wish to discuss further which reaction to choose when the resources are very limited. The better is to study more or all suggested reactions. The physics significance of possible reactions can also vary depending on what comes out from the early LHC running. Now the software group has begun to prepare for simulations which hopefully allow the detector groups to investigate more than a few new channels.

There is one more technical but important issue in the recommendation. Namely it is recommended that both of the detector groups use a common costing method. Our experience tells it is not trivial but we have to find a way. Also pointed was that the estimation should be accurate enough not to expand in the future.

-- Sakue Yamada



IDAG meeting at Beijing in March 2010.
Image: IHEP/Jie Liu.