

IDT-WG2 report

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(June 14, 2022)

-Update of the Time-critical WP document

-International discussion for realisation of a large-scale accelerator facility as a global project (June 9, from IDT-EB chair)

Conference information:

July 6-13: ICHEP 2022 (Bologna, Italy)

<https://agenda.infn.it/event/28874/program>

July 17-26: Snowmass Community Summer Study Workshop

<http://seattlesnowmass2021.net/>

Update of the Time-critical WP document

Ver.7: There was a comment from WG3 about the WPP-16 and IDT-EB changed a little at WPP-16. (to accept MDI/detector activities before Pre-lab starting.)

WP-prime-16:Final doublet design optimization

~~item to BNL alone. The QD0 magnets are integrated into the detectors and thus vibration / stabilization studies need input from and thus should be conducted together with the detector concept and MDI groups. This time-critical WP should be completed before ILC Pre Lab starts and should be reflected in the design of the FD, detectors and their interfaces, which will be conducted during the ILC Pre Lab period.~~

Ver.8: There was some discussion at IDT-EB this week about a slight revision to the SRF portion of the Time-critical WP.

- → WP-prime-1⁴
 - → Fundamental research using 1-cell cavities to prepare for 9-cell cavity production⁴
 - → High pressure gas safety regulation issues to be addressed⁴
 - → 9-cell cavity production ~~with common specifications by common vendors~~ as a global effort⁴
 - → 9-cell cavity production as a domestic contract⁴
- → WP-prime-2⁴
 - → Finalization of CM drawings including ancillaries such as the tuner, coupler and SC magnet⁴
 - → High pressure gas safety regulation issues to be addressed⁴
- → WP-prime-3⁴
 - → Prototype crab cavity production⁴
 - → Harmonized test with two crab cavities⁴
 - → Final down selection⁴
 - → Engineering design of prototype CM⁴

In WP-prime 1, eight 9-cell cavities will be produced in each region with the budgets provided by the regions, for a total of 24 cavities. This number installed into cryomodules (CMs) produced in the Pre-lab phase (currently assumed to start in Y3) will satisfy the high pressure gas safety (HPGS) regulation in Japan. The process will be to establish globally agreed, common specifications. Procurements/~~contracts with possible common vendors~~ will be implemented individually in each of the three regions. This process will provide essential experience for

4,2022)

Remove “common vendors” and emphasize “common specifications”

International discussion for realisation of a large-scale accelerator facility as a global project

Together with the time critical R&D work on the accelerator, **this is one of the two tasks** we need to perform.

Introduction

The International Linear Collider (ILC) was conceived and has evolved as a global project under the umbrella of ICFA. Since 2012, ICFA has been supporting the proposal by the Japanese high energy physics community to host the ILC in Japan as a global project and created the International Development Team (IDT) in August 2020.

In June 2021, the IDT proposed to create the ILC Preparatory Laboratory (Pre-lab) as an international network of laboratories with headquarters in Japan, with a view that this would be a necessary step for having an intergovernmental negotiation for the sharing of the cost and responsibilities for the ILC among the international partners. MEXT expressed its view that it could not proceed toward the Pre-lab before having a prospect for the international cost sharing. Those two views are not compatible. The Advisory Panel of MEXT for the ILC concluded that it was premature to proceed toward the Pre-lab and recommended re-evaluation of the roadmap of the ILC project in a global context taking into account the progress in other Higgs factory studies.

In order to move forward with a fresh start, the IDT will organise international discussions, supported by KEK and with MEXT cognisance, to address those topics. The discussion will start by developing a general description of the evolution of a global project from conception to operation, which could be applicable to the ILC. Discussion for the specific case of the ILC will then follow, describing the full lifecycle of the project, suggesting processes for necessary decisions and potential consequences of those decisions. Possible implementation models could also be included in the discussion. Note however that the final implementation will be settled by the future intergovernmental negotiations.

The discussion will be carried out by an International Expert Panel consisting of scientists who are experienced in working with large international collaborations and well connected with both the particle physics community and government authorities. Through regular contact, the Panel members will make certain that government authorities and CERN are well informed about the status of the discussion and its progress. In this way, the authorities can provide frequent feedback through the Panel members. Occasional meetings of the Panel together with officials from the governments interested in the ILC and from CERN will be needed to ensure that all opinions are shared and discussed, in order that a common view among the participants

Timeline

- June 2022: Appointment of the International Panel Members
- June 2022: The first meeting of the International Expert Panel in remote mode
- July to October 2022: Drafting of the Discussion Document by the Core Group for the first part, i.e. general discussion of a global project that could be applicable to the ILC. The drafting will be done in close consultation with the International Expert Panel, whose members will keep close communication with the government authorities, CERN and the community.
- November 2022: The first face-to-face meeting of the International Expert Panel to review the first part of the draft.
- December 2022: Intermediate review by a face-to-face meeting with the officials of the governments and CERN on the first part. Based on the outcome of this meeting, a plan for the rest of the work will be defined.

-*ICFA statement:* https://icfa.hep.net/wp-content/uploads/ICFA_Statement_April2022_Final.pdf

-*KEK news:* <https://www.kek.jp/en/topics-en/202204121810/>



ICFA Statement Regarding Higgs Factory Development and the ILC

The International Committee for Future Accelerators (ICFA) recently met to review global progress and plans in high-energy physics. ICFA reaffirms the international consensus on the importance of a Higgs Factory as the highest priority for realizing the scientific goals of particle physics. This view has only strengthened over time based on results from the world's particle physics facilities. Various design studies based on different technologies are in progress, including both circular colliders (FCC-ee and CEPC) and linear colliders (ILC and CLIC). ICFA follows with great attention the development of Higgs Factory proposals worldwide and recognizes the importance of advancing such concepts.

ICFA also reaffirms the importance of the regional planning activities that have recently been completed and those underway, which for decades have underpinned the global strategy for the field. Indeed, following the 2020 update to the European Strategy for Particle Physics, Europe is now undertaking a feasibility study for FCC. ICFA eagerly awaits the results of ongoing strategic planning activities in the U.S., China and elsewhere.

Concerning the International Linear Collider (ILC), ICFA reaffirms its position that the concept for the ILC is technically robust and has reached a level of maturity which supports its moving forward with the engineering design study toward its timely realization. Indeed, recent accelerator projects across the globe confirm the readiness of the foundational superconducting accelerator technology.

ICFA commits to continuing efforts within the International Development Team (IDT) over the next year to coordinate the global research community's activities toward further developing and realizing the ILC in Japan. In particular, the IDT will work to further strengthen international collaboration among institutes and laboratories, and to expand the broad support from various stakeholders. ICFA will monitor developments over the next year to assess availability of resources and progress in international discussions.

ICFA continues to encourage inter-governmental discussion between Japan and potential partner nations to advance international collaboration toward important research and development activities as well as coordination toward realization of an ILC.

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