IDT-WG2 report

Shin MICHIZONO (KEK/IDT-WG2)

(Aug. 24, 2021)

- ILC advisory panel
- ILCX

ILC advisory panel

First advisory panel was held on July 29.
https://www.mext.go.jp/kaigisiryo/2021/mext_00253.html

Charges of the panel:
(1) Prospects for international research cooperation and cost sharing
(2) Academic significance and understanding of the public and scientific community
(3) Clarification of technical feasibility
(4) Reasonableness of cost estimates
(5) Prospects for training and securing human resources
(6) Other issues related to ILC

See the note on Aug.3 in the WG2 mailing list

Schedule:
The panel is planned to be concluded by the end of 2021, or at latest by the end of March 2022.
2nd panel (120 min.)
-Overview of the ILC project and the history to date [5+5].
-IDT proposal [15+20].
-Technical feasibility and validity of cost estimate (accelerator) [20+25].
-Discussions among expert committee members [30].

Speakers are not decided yet. (negotiation with MEXT)

Slide preparation taskforce

- In order to prepare the slides at the ILC advisory panel, "slide preparation taskforce" was organized. (Chair: Prof. Kawagoe (Kyushu U.))
- Not only the accelerator, but also other presentations will be advised by this taskforce.
- From accelerator, Michizono, Terunuma, Kuriki, Sanuki are the members.
- Concerning the accelerator related presentations, these drafts are under preparation

(a) Basic information about ILC progress (up to now)
Since most of the advisory panel members are non-expert (of the accelerators), we have to include basic information about the ILC technology.

(b) Response to the previous ILC advisory panel and SCJ
- Response to the issues pointed out
- Activities from 2018 to 2021

Based on the information at each group on July.

(c) WPs during pre-lab (corresponding to the issues raised by ILC advisory panel and SCJ)

Based on "Pre-lab proposal"

(d) In addition, I asked some of the IDT-WG2 members to prepare the ILC related activities (~2018, 2018~2021, and future potential for the WPs). (USA, England, France, Spain, CERN etc.)

Total presentation time for them will be less than 30 min. (Even though we will submit various materials, the presentation slides themselves are ~30.)

Please understand that this task force handles the editing of the slides.

Some of the slides
(under preparation)

Achievement of ILC technology and future plan

(a) Basic Draft

Since the publication of the Technical Design Report (TDR) in 2013, the key technical developments have progressed and >90% of the technologies required for construction have been established.

Technology achievement	60% 70% 80% 90% 100%	tasks
SRF cavity	～2018 Technology development ->Model work-> Prototype (CFF) (STF) / 2018～2021 High performance and cost reduction of cavities / *2021*	International shared mass production demonstration (Confirmation of performance achievement)
Cryomodule (CM)	(construction and operation of the EuXFEL, the role of the accelerator prototype)	(International transfer demonstration)
e- source	～2018 Tech. Design->Tech. Development->Model->Tech. Demonstration	confirmation
e+ source Undulator scheme	～2018 Tech. Design->Tech. Development->Model / 2018～2021 Tech. Demonstration	Target, magnetic focusing
e+ source e-driven scheme	～2018 Tech. Design->Tech. Development ->Model / 2018～2021 Tech. Demonstration	Target, capture cavity
DR	～2018 Tech. Design->Tech. Development->Model-> Tech. demonstration achieved at KEK ATF	Kicker
Final focus	～2018 Tech. Design->Tech. Development->Model-> Tech. demonstration achieved at KEK ATF	Stable operation
Dump	～2018 Tech. Design->Tech. Development->Model / 2018～2021 Facility design	Remote handling

Legend (colour): ：～2018 ：2018～2021 ：2022～

Model work: small-scale models, partial/component models.
Prototype: demonstration at the full scale.
Demonstrator: Technology transfer (to industry) for manufacturing of actual equipment.

これまでの技術達成度と今後の課題

2013年に技術設計書(TDR)を出版以降、鍵となる技術開発が進展し、
建設に必要な技術の90%以上は確立している。

技術到達度	60% ～ 100%	課題
SRF空洞	～2018 技術開発 → モデルワーク → プロトタイプ達成 (CFF) (STF) ／ 2018～2021 空洞の高性能化・コスト削減 ／ *2021*	国際分担量産実証（性能達成確認）
クライオモジュール (CM)	（この間、**European XFEL** 建設・運転実績 →加速器プロトの役割）	国際分担量産実証（国際間移送実証）
電子源	～2018 技術設計→ 要素技術開発→ モデル→ 要素技術実証達成	確認
陽電子源 アンジュレータ駆動	～2018 技術設計→要素技術開発→モデル ／ 2018～2021 要素技術実証達成	回転ターゲット・磁気収束
陽電子源 電子駆動	～2018 技術設計→要素技術開発→モデル ／ 2018～2021 要素技術実証達成	回転ターゲット・捕獲空洞
DR	～2018 技術設計→ 要素技術開発→ モデル→ KEK ATFで技術実証達成	高速キッカー（更なる高度化）
最終ビーム収束	～2018 技術設計→ 要素技術開発→ モデル→ KEK ATFで技術実証達成	安定運転
ビームダンプ	～2018 技術設計→ 要素技術モデル検証 ／ 2018～2021 施設設計の具体化	遠隔ビーム窓交換等

：～2018年
：2018年～2021年
：2022年～

モデルワーク（モデル）：小規模モデル、部分/要素モデル。
プロトタイプ（プロト）：スケールが同じ (full scale)規模での実証。
実証機(実証)：実機製造の為の（工業界への）技術移転。

Progress in SRF

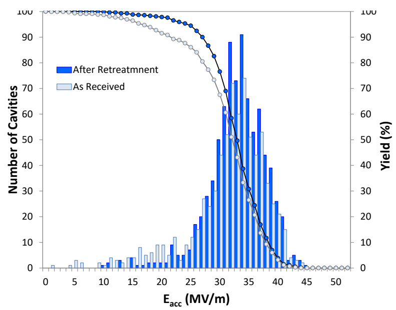
(b)Response Draft

～2018	2018～2021	2022～

Cavity

Yield evaluation of cavities based on TDR

Eu-XFEL: 33MV/m achieved at 82%.
(ILC specification: 35MV/m at 90%)



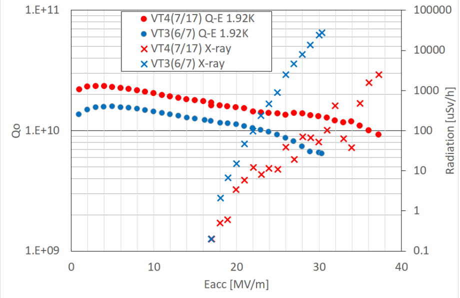
Euro-XFEL Operation (Europe)
~800 cavities/
~100 Modules

LCLS-II Construction (USA)
~280 cavities/
~35 Modules

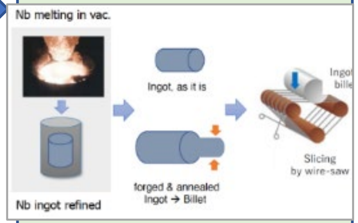
Realized through international cooperation and procurement

High performance and cost reduction

High performance with new surface treatment, etc.



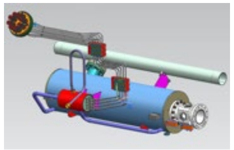
N-infusion cavity Installation to the STF-2 (KEK)



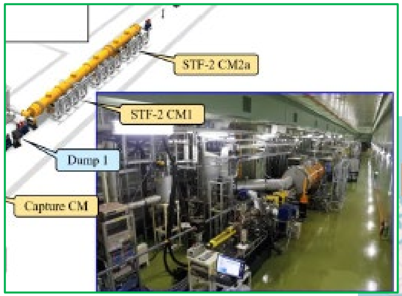
Cavity manufacturing, performance demonstration (Yield demonstration in three areas)

Cryomodule

Eng. design



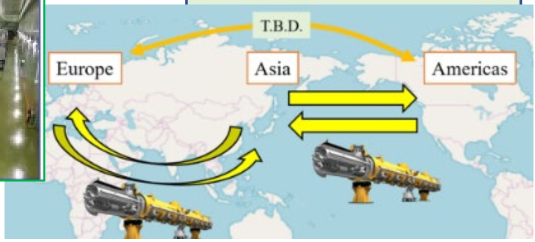
Module assembly



Accelerator performance verification at KEK-STF2

Development of clean environment construction and assembly automation to maintain cavity performance

Demonstration of cryomodule assembly, transfer, and performance



超伝導高周波技術の進展

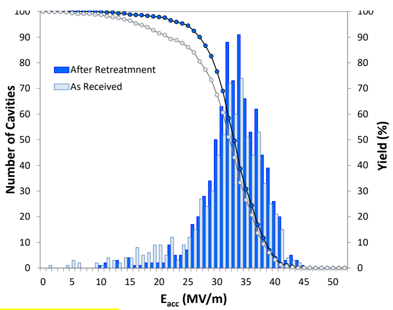
Draft

～2018	2018～2021	2022～

空洞

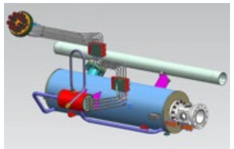
TDRに基づいた
超伝導空洞の
歩留まり評価

Eu-XFELにて：33MV/mを82%で達成
（ILC仕様：35MV/mを90%)



クライオ
モジュール

技術設計



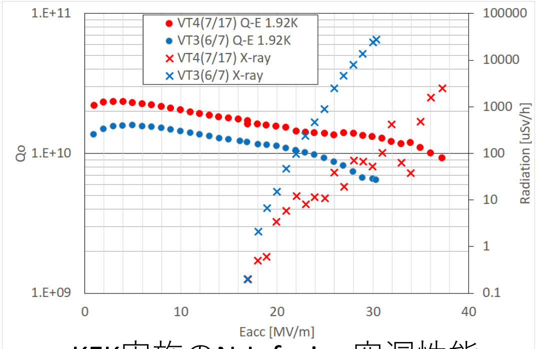
Euro-XFEL 運用（欧州）
~800空洞/
~100モジュール

LCLS-II 建設（米国）
~280空洞/
~35モジュール

国際協力・国際調達
により実現

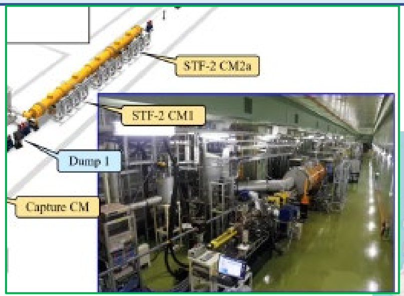
空洞・高性能化
コスト削減

新表面処理等で高性能化



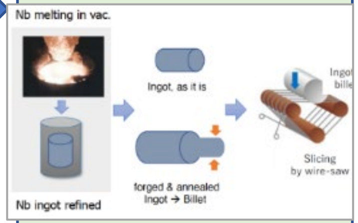
KEK実施のN-Infusion空洞性能
（STF-2へ実装）

モジュール組み立て技術



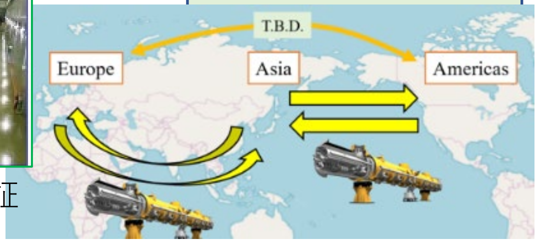
KEK-STF2での加速器性能検証

空洞性能を維持する
清浄環境構築・組立自動化開発



空洞製造、歩留まり実証を含む空洞性能実証
（3 領域での歩留まり実証）

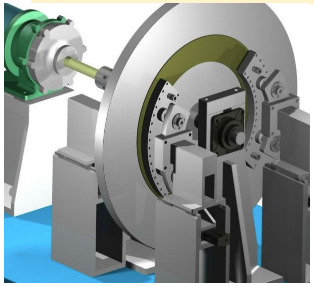
クライオモジュールの組立・評価・移送・性能保持の実証



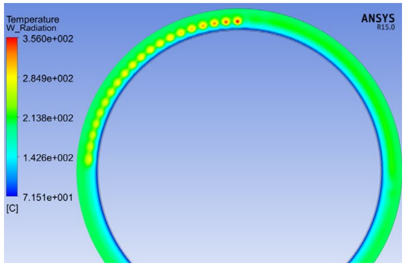
Progress in positron source

(b)Response Draft

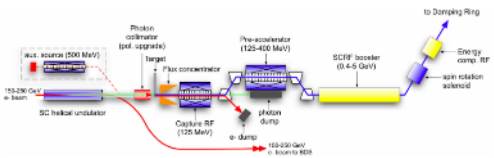
～2018 tech. design



High-speed rotating positron target, Technology Design

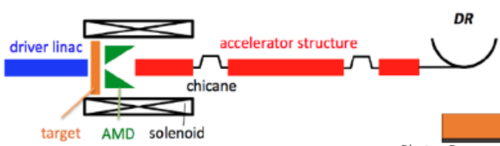


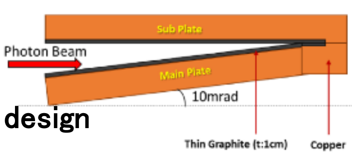
Target thermal simulation



e+ source total design

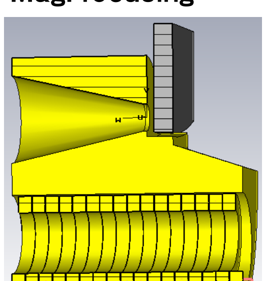
Undulator prototype



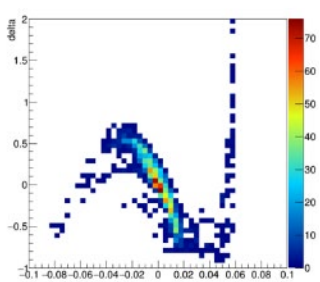


Photon dump design

Mag. focusing



Paricle simulation

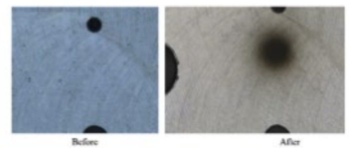


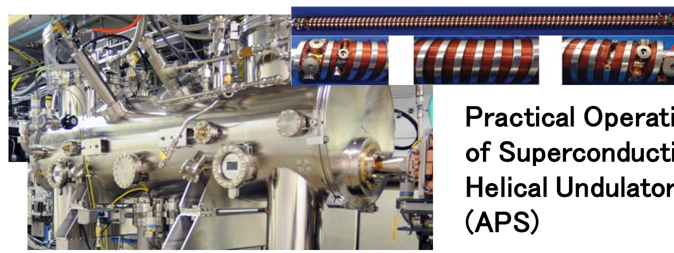
2018～2021 tech. verification

Target Prototyping
Vacuum characteristics
Testing

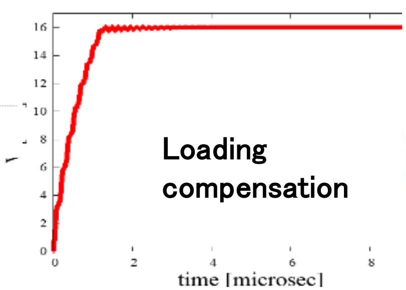
Target before and after radiation:

Ti target beam test

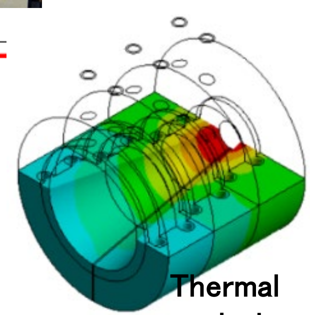




Practical Operation of Superconducting Helical Undulator (APS)



Loading compensation

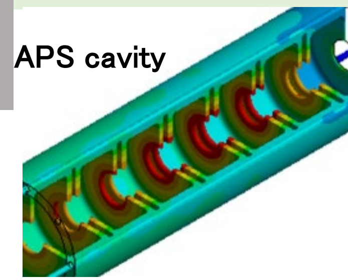


Thermal analysis

Plan A:Undulator scheme
Plan B:e-driven scheme (same tunnel)
Plan C:e-driven scheme (extra tunnel)

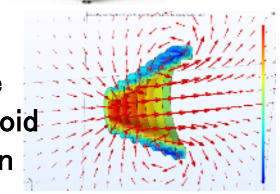
2022～Detailed design.

APS cavity

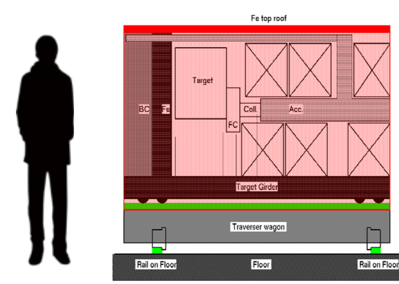


RF stability test

Pulse solenoid design



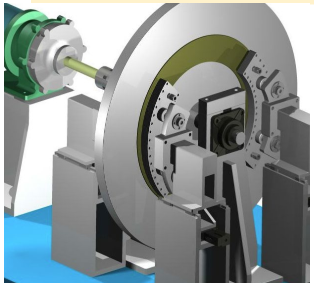
Target maintenance



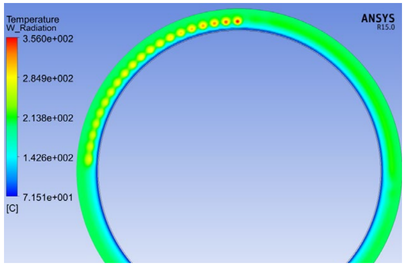
陽電子源の進展

Draft

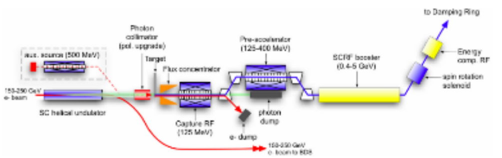
～2018　技術設計



高速回転陽電子標的
技術設計

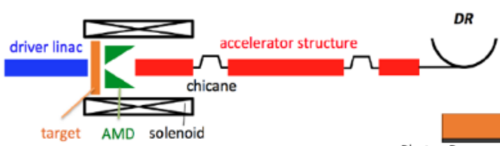


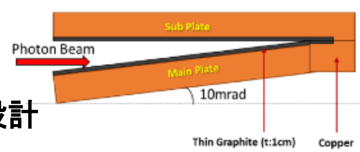
標的熱シミュレーション



陽電子源全体設計

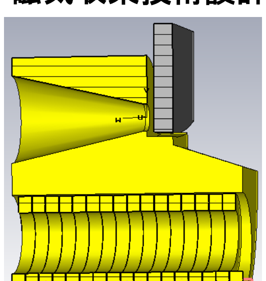
アンジュレーター
プロトタイプ



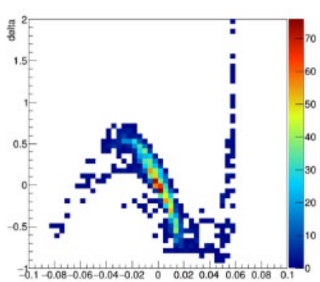


光子ダンプ設計

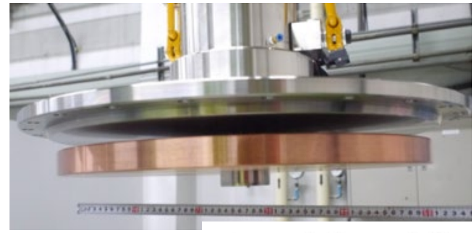
磁気収束技術設計



粒子シミュレーション



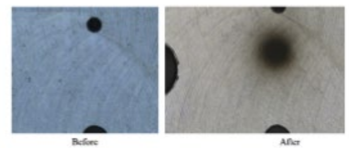
2018～2021　技術検証

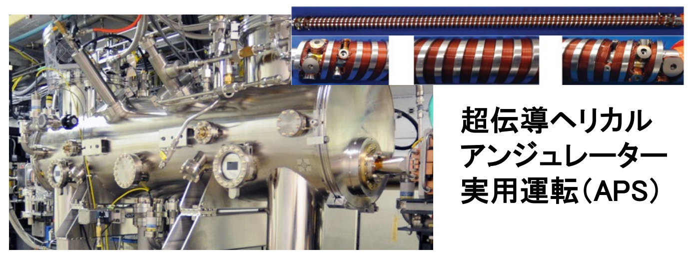


標的プロト
タイプ作成
真空特性
試験

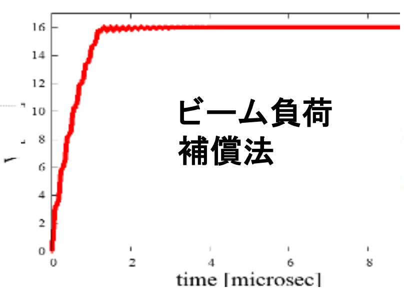
チタン標的
ビームテスト

Target before and after radiation:

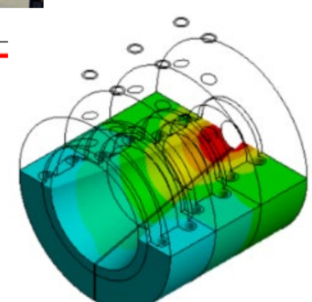




超伝導ヘリカル
アンジュレーター
実用運転(APS)



ビーム負荷
補償法

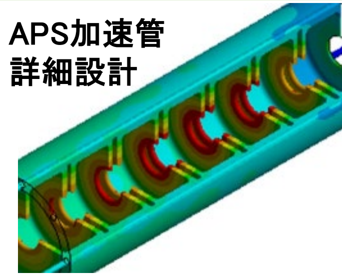


熱解析

Plan A:アンジュレータ方式
Plan B:電子駆動方式を同一トンネル
Plan C:電子駆動方式を別トンネルに設置

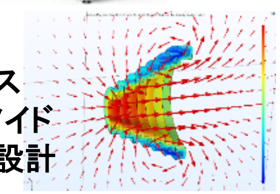
2022～詳細設計

APS加速管
詳細設計

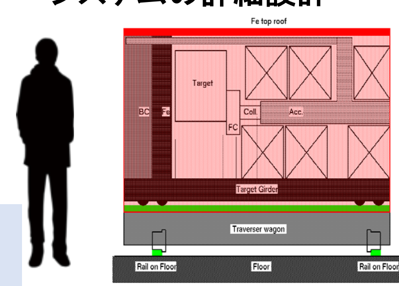


RF長期信頼性試験

パルス
ソレノイド
詳細設計



陽電子標的メンテナンス
システムの詳細設計



10

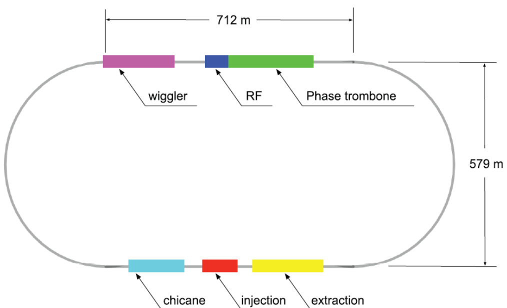
Progress in DR

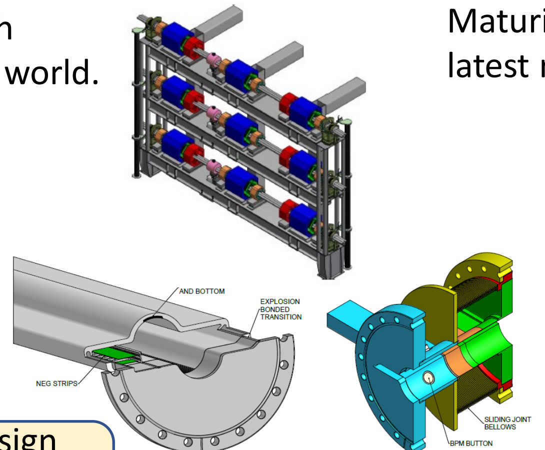
(b)Response Draft

～2018	2018～2021	2022～

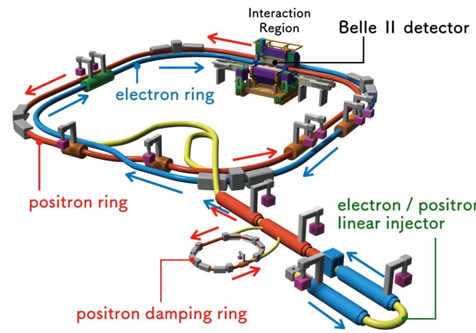
DR — Eng. design

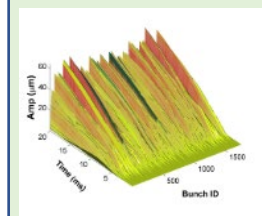
Design based on experience with circular accelerators around the world.





Maturing technology for beams in the latest ring accelerators such as SuperKEKB

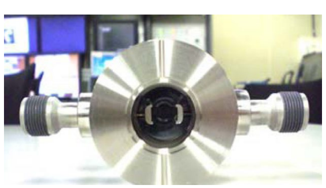


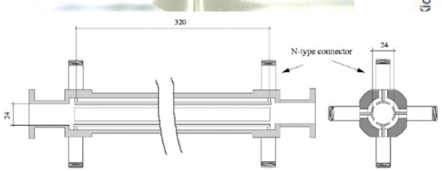


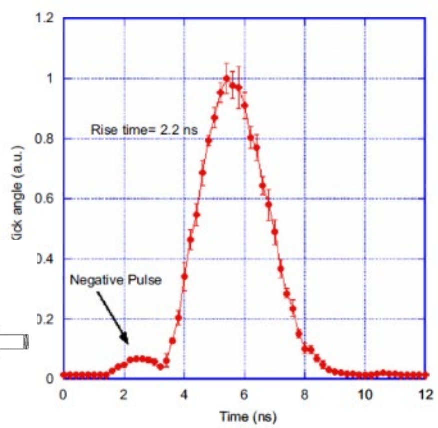
Final design

Inj./Ext. — Eng. Design Equipment verification

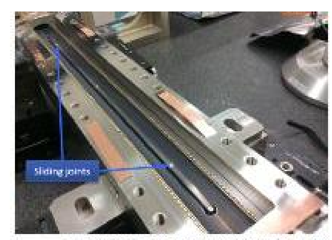
Beam extraction verified.



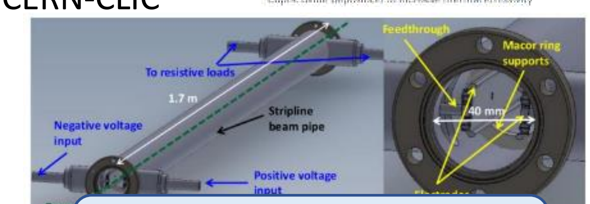




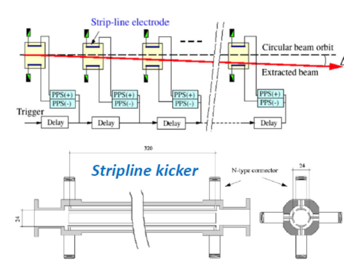
LBNL



CERN-CLIC



Fast kicker technology for other accelerators



Stable op.

ダンピングリングの進展

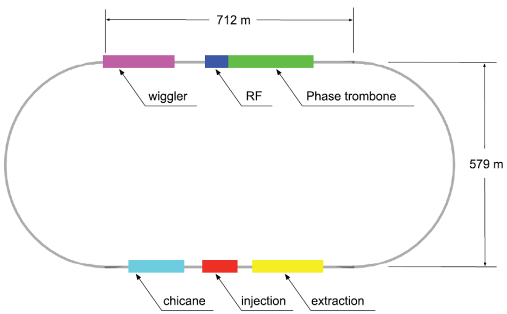
Draft

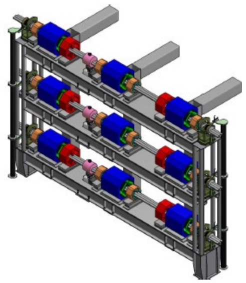
～2018	2018～2021	2022～

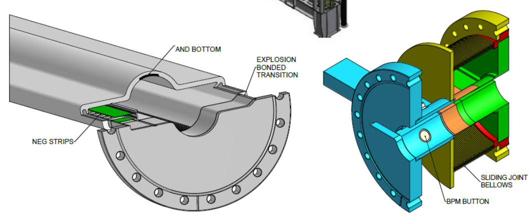
ダンピングリング

技術設計完了

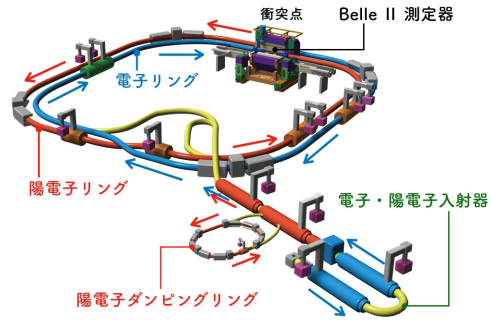
国内外のリング加速器での
豊富な実績に基づく設計

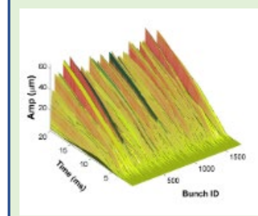


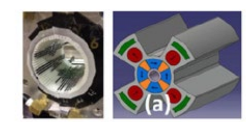




SuperKEKBなど最新リング加速器
での高性能ビーム技術の熟成







CBETA
Fixed field

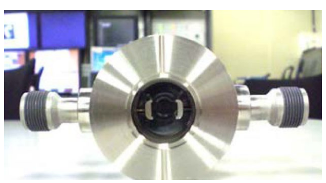
QUAPEVA (Soleil)
Factor of 2 tuning

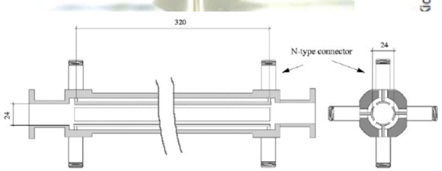
詳細設計

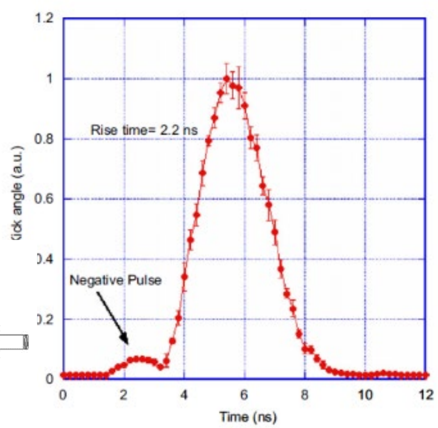
入出射
（高速キッカー）

技術設計
機器実証

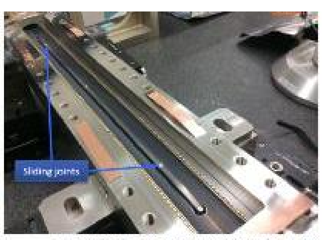
ビーム取出実証できた



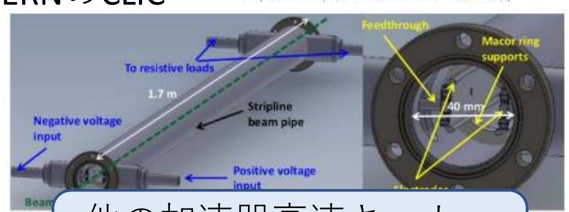




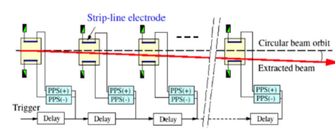
米国LBNL

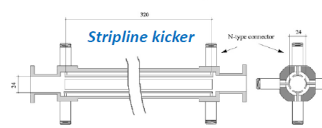


CERNのCLIC



他の加速器高速キッカー
新技術による高度化



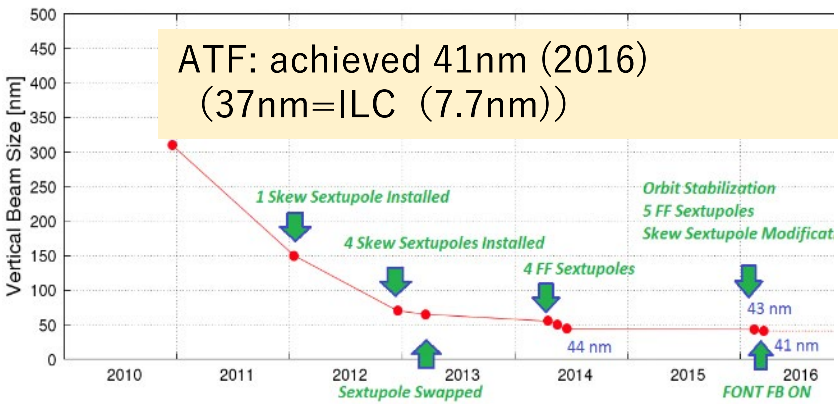


安定運転実証

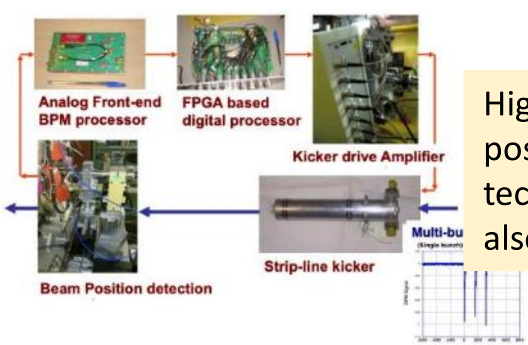
Progress in final focus

(b)Response Draft

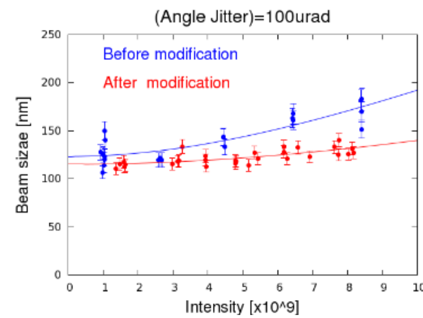
～2018	2018～2021	2022～
Tech. design completed Spec. almost achieved	Wakefield effect	Detailed design Stable operation demonstration



ATF: achieved 41nm (2016)
（37nm=ILC（7.7nm)）

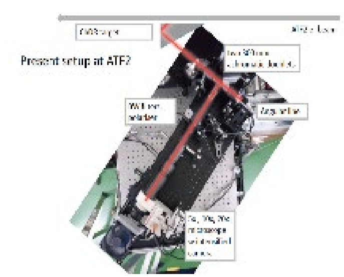


High-speed beam position control technology was also demonstrated.



Beam induced electromagnetic field effect evaluation test was conducted at ATF.
-No problem with ILC beam
-A technique to reduce the influence of the beam induced electromagnetic field was demonstrated.

ATF International Review (Committee)
-The committee highly evaluated the achievements of ATF so far.
-The committee pointed out the importance of continuing research to contribute to the detailed design of the ILC final convergence.

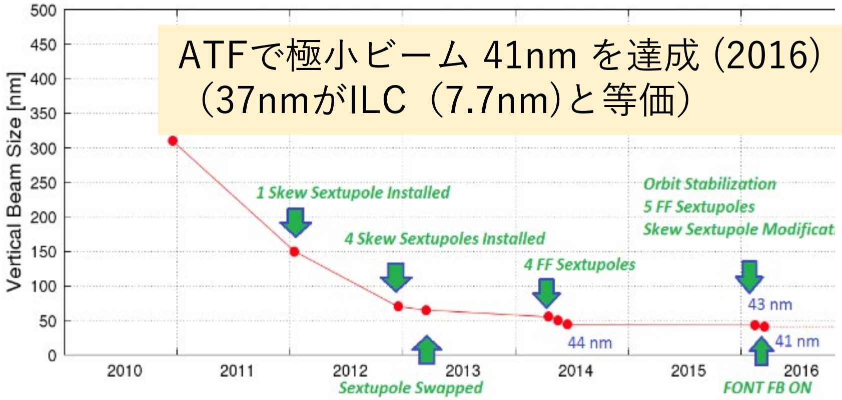


Modify the beam monitor system, etc. at ATF to demonstrate stable operation。

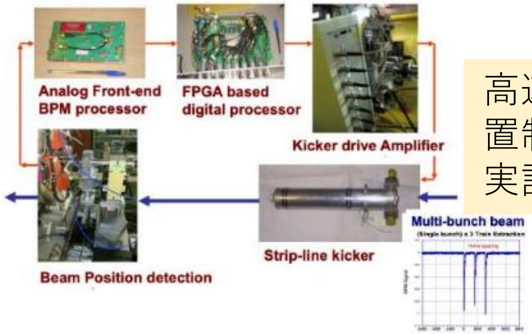
最終収束の進展

Draft

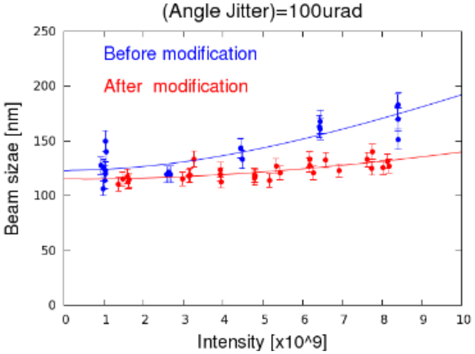
～2018	2018～2021	2022～
技術設計完了 目標仕様ほぼ達成	ビーム誘導電磁場 の影響評価	詳細設計 安定運転実証



ATFで極小ビーム 41nm を達成 (2016)
（37nmがILC（7.7nm)と等価）



高速ビーム位置制御技術も実証



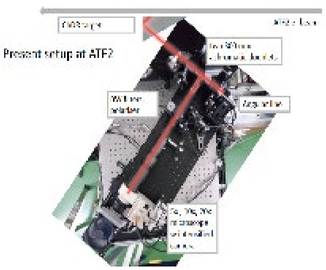
ATFにおいてビーム誘導電磁場の影響評価試験を実施

- ILC衝突ビームでの問題は無いと評価した。
- ビーム誘導電磁場の影響低減技術を実証した。

ATF国際レビュー（委員会）

→ 今までのATFの成果を高く評価した。

→ ILC最終収束の詳細設計に資する研究継続の重要性を指摘した。



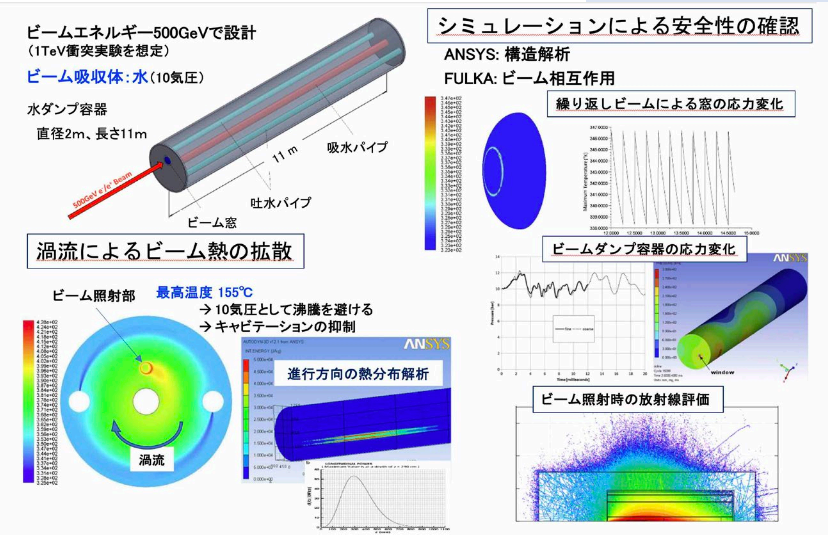
ATFでビームモニター系など改造して安定運転を実証する。

Progress in beam dump

(b)Response Draft

～2018	2018～2021	2022～
Basic design (by researchers abroad)	Design revalidation and materialization of facility design	Maintenance equipment design Detailed design

Design revalidation by KEK
-Structural Analysis
- Radiation evaluation

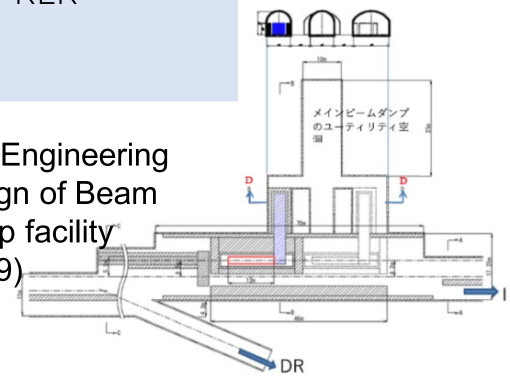


Consultations with beam target/dump experts from around the world beyond ILC

LHC beam dump (2017)

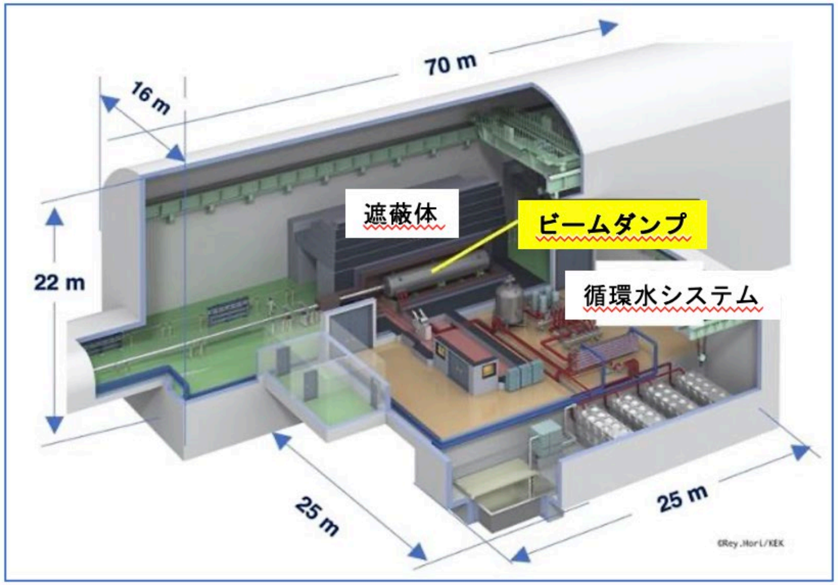
RADIATE collaboration

Civil Engineering Design of Beam Dump facility (2019)



- Testing of main components of circulating water system
- Beam window replacement device
- Safety design

Detailed system design

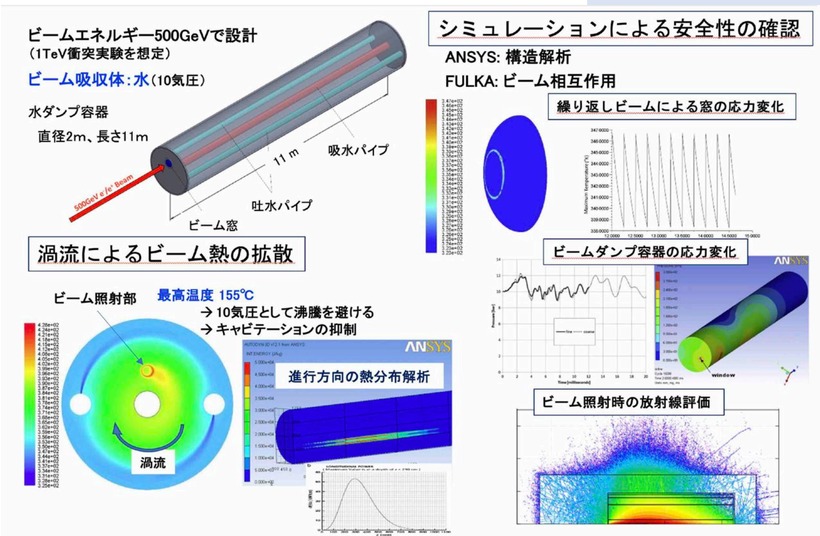


ビームダンプの進展

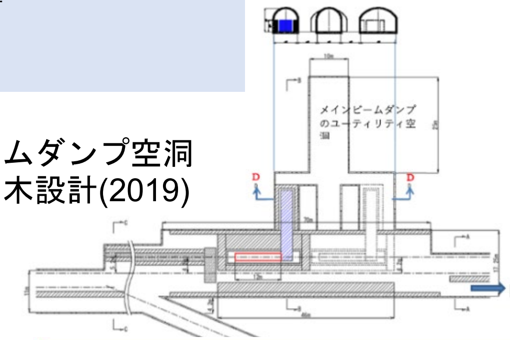
Draft

〜2018	2018〜2021	2022〜
基本設計 (欧米研究者が担当/取りまとめ)	設計再検証・設備設計の具体化	保守装置設計 詳細設計

KEKによる設計再検証
- 構造解析
- 放射線評価

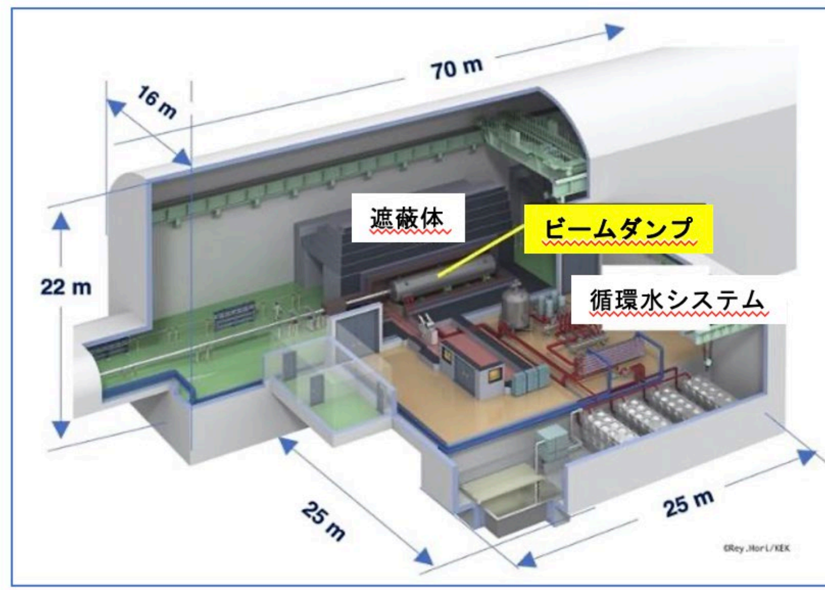


ビームダンプ空洞の土木設計(2019)



- 循環水システム主要部品の試験
- ビーム窓交換装置
- 安全設計

システム詳細設計



ILCの枠を越えた世界のビーム標的/ダンプ専門家との協議

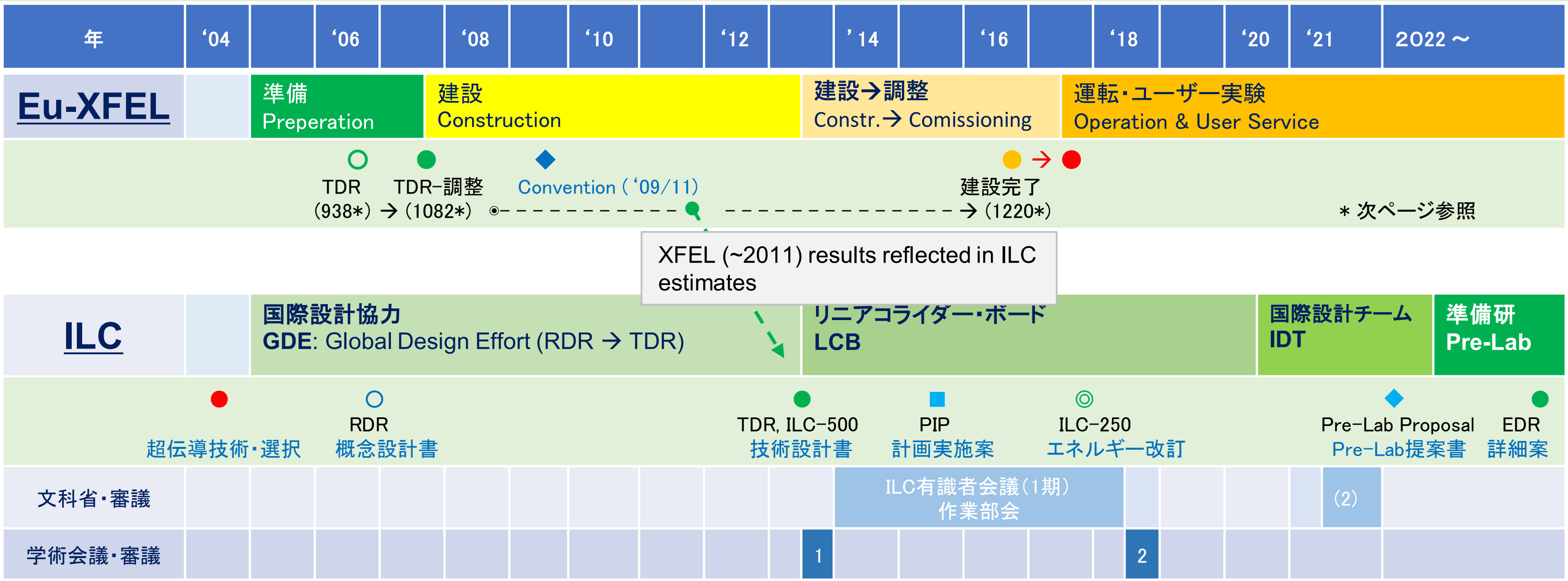
LHCビームダンプ(2017)

RADIATEコラボレーション

European XFEL construction in ILC preparation

(b)Response Draft

The European XFEL construction was completed in 2017 within the scope of the original budget revised in 2008 (TDR-adjusted) plus the additional budget approved in 2015 (+13%).
The ILC accelerator construction cost estimate reflects the original European XFEL construction budget adjusted in 2008 (TDR-adjusted) and the progress of budget execution until 2011.



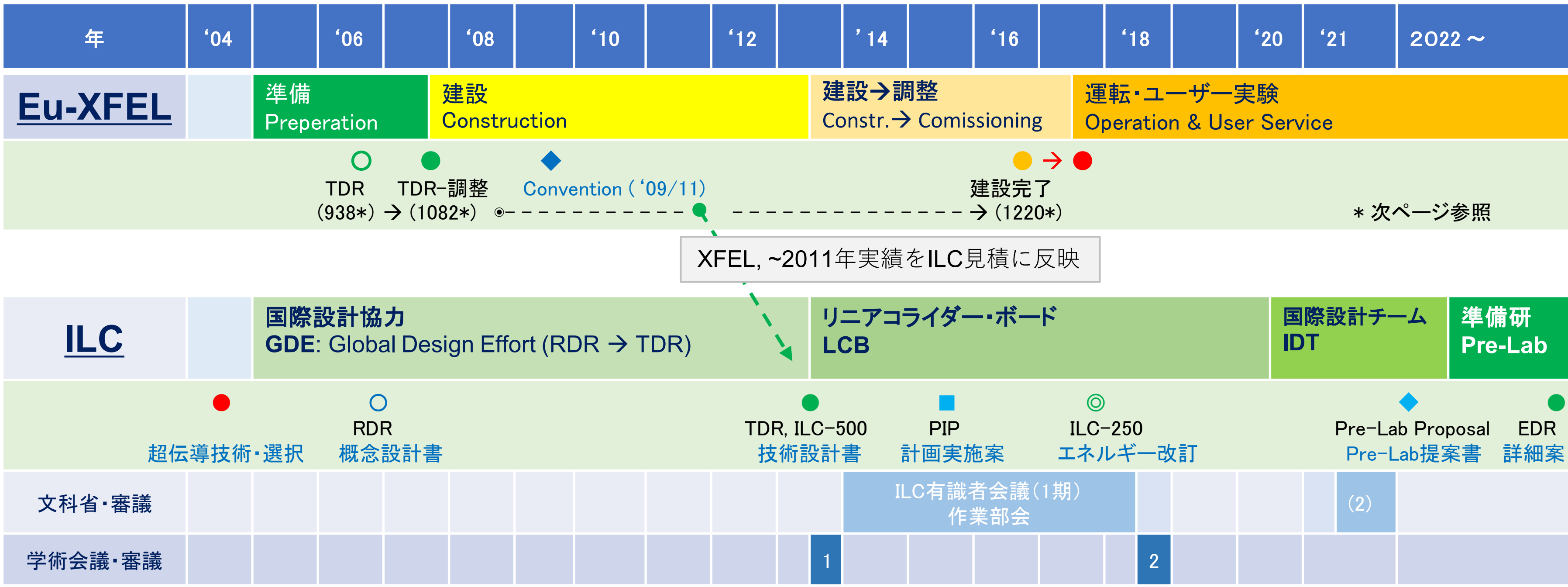
Note: ILC-PIP: ILC Project Implementation Plan (2015), TDR: Technical Design Report, CDR: Conceptual Design Report, EDR, Engineering Design Report (詳細技術設計書)

The ILC has been developing accelerator design and technology based on the superconducting technology selected in 2004, and published as the basic technical design document (ILC-TDR) in 2013. In 2017, the ILC250 plan was revised to focus on Higgs Factory, and preparations are underway for further detailed design and technology maturation. During this period, the European Free Electron Laser Facility (Eu-XFEL), which is based on the same superconducting technology and is 1/10th the size of the ILC project, was constructed and completed in 2017. The construction of the Eu-XFEL was completed in 2017.
The construction of the Eu-XFEL was completed in 2017 within the scope of the original budget revised in 2008 (TDR-adjusted) plus the additional budget approved in 2015 (+13%). The breakdown of the additional measures is "soaring civil engineering costs due to the economic boom" and "additional labor costs due to the extension of the construction period (within one year)" accounting for >2/3, while the cost increase of the accelerator itself is limited to <1/3 (see below).
The ILC accelerator construction cost estimate reflects the original Eu-XFEL construction budget adjusted in 2008 (TDR-adjusted) and the progress of budget execution until 2011. Referring to the later additional measures (XFEL reserve fund, approved in 2015), the ILC accelerator construction budget can be risk-responsive by reserving Contingency (10%: ILC-PIP proposal and recommendations of the first phase and expert panel) and taking measures according to the construction progress.

ILC建設へのEuropean XFEL建設実績の反映

Draft

European XFEL建設は、2008年改訂の当初予算（TDR-adjusted）に、2015年に認められた 追加予算(+13%)を加えた範囲内で2017年に完成している。
ILC 加速器建設費の見積は、2008年に調整されたEuropean XFEL建設当初予算 (TDR-adjusted) および2011年までの予算執行経過が反映された。



Note: ILC-PIP: ILC Project Implementation Plan (2015), TDR: Technical Design Report, CDR: Conceptual Design Report, EDR, Engineering Design Report (詳細技術設計書)

- ILCは2004年に選択された超伝導技術に基づく加速器設計・技術開発を進め、2013年に基本技術設計書（ILC-TDR) として出版した。2017年には、Higgs Factory に焦点を絞ったILC250 計画に改定。更に詳細な設計、技術の成熟を目指し準備が積み重ねられている。
- この間、 同様の超伝導技術を基盤とし、ILC 計画の1/10規模となる欧州自由電子レーザ施設（Eu-XFEL) が建設され、2017年に完成している。 4 年間を超える安定なユーザー運転実績を重ね、超伝導加速器システムとして、ILC プロトタイプ加速器・技術実証への重要な実績を示す役割を果たしている。
- Eu-XFEL建設は、2008年改訂の当初予算（TDR-adjusted）に、2015年に認められた 追加予算(+13%)を加えた範囲内で2017年に完成している。追加措置での内訳は「好況による土木工事の高騰」および「建設期間延長（１年以内）による人件費の追加」が > 2/3を占め、加速器本体のコスト増加は< 1/3 に留まっている (後述参照)。
- ILC 加速器建設費の見積は、2008年に調整されたEu-XFEL建設当初予算 (TDR-adjusted) および2011年までの予算執行経過が反映された。後の追加措置 (XFEL予備費、2015年承認) も参考とすると、ILC 加速器建設予算は、Contingency (10%： ILC-PIP提案及び一期・有識者会議の提言）をリザーブし、建設進捗に応じた措置とする事でリスク対応が可能となる。

European XFEL construction budget evolution (based on 2005 Euro)

(b)Response Draft

The construction of Eu-XFEL was completed in 2017 within the scope of the original budget revised in 2008 (TDR-adjusted) plus the additional budget approved in 2015 (+13%).

	TDR for Pre-XFEL start-up	TDR adjusted for Full-Performance	Update in mid. constr.	Update Final	Ratio
	2006~2007	Feb. 2008			
Agreement/approval	July 2007 (Collab. Agree.)	Nov. 2009 (Council)	2012 (Council)	2015 (Council)	
Preparation	39M€	39M€	→ 39M€		
Construction	849M€	986M€	→ 986M€		
Commisioning	50M€	50M€	→ 50M€		
Risk budget (for 98% success)	---	(+78M€: only proposal)	＋78M€ (budgeting)		
Additional				+66M€	
Total construction	**938M€ →**	**1,082M€ →**	**1,160M€ →**	**1,226M€** **1,226M€**	+13 % * +6% **

Notes.
*Eu-XFEL construction started, increase rate against total initial budget center value (probability of success: 50%): 13 %.
Additional factors: "Temporary price hike due to booming civil engineering and construction costs" + "Labor cost increase due to construction delay": ≥ 2/3 (of +13%), "Increasing cost of accelerator elements": ≤ 1/3 (of +13%), {Increase ratio of accelerator to original budget: ≤ 12%}
** (Reference) Construction cost increase relative to budget at start of construction (98% certainty of success): 6%.

https://www.xfel.eu/organization/leadership/council/basic_documents/index_eng.html
https://www.xfel.eu/news_and_events/news/index_eng.html?openDirectAnchor=1273&two_columns=0

European XFEL 建設予算の推移（2005年ユーロを基準）

Draft

European XFEL建設は、2008年改訂の当初予算（TDR-adjusted）に、2015年に認められた 追加予算(+13%)を加えた範囲内で2017年に完成している。

	TDR for Pre-XFEL start-up	TDR adjusted for Full-Performance	Update in mid. constr.	Update Final	Ratio
TDR → 完成	2006~2007	Feb. 2008 (調整)	建設(中間)	完成(前)	
合意／承認 年	July 2007 (Collab. Agree.)	Nov. 2009 (Council)	2012 (Council)	2015 (Council)	
準備	39M€	39M€	→ 39M€		
建設	849M€	986M€	→ 986M€		
コミッショニング	50M€	50M€	→ 50M€		
リスク予算 (成功確度98%の為)	---	(+78M€: 提案のみ)	＋78M€ (予算化)		
追加（不足補填）				+66M€	
建設予算・合計	**938M€ →**	**1,082M€ →**	**1,160M€ →**	**1,226M€** **1,226M€**	+13 % * +6% **

ノート：

* European XFEL 建設開始・当初予算総額中心値（成功確度・50%）に対する上昇率: 13 %
追加要因：「土木・建築費の好況による一時的価格高騰」+「建設遅延による人件費増加」：≥ 2/3 (of +13%)
「加速器本体要素コスト増加」：≤ 1/3 (of +13%), {加速器本体当初予算に対する加速器分増加比率: ≤ 12%}

** （参考）；建設開始時予算（成功確度・98%）に対する建設費上昇率: 6%

IDT–WG2

(c) WPs Draft

The Accelerator Division (WG2) of the International Development Team (IDT) has about 50 accelerator researchers from 19 research institutes in 9 countries around the world participating in discussions on ILC accelerator development research.

IDT–WG2

Draft

国際推進チーム（IDT）の加速器部門（WG2）は、世界9か国19研究機関から約50名の加速器研究者が参加し、ILC加速器開発研究の議論を行っている。

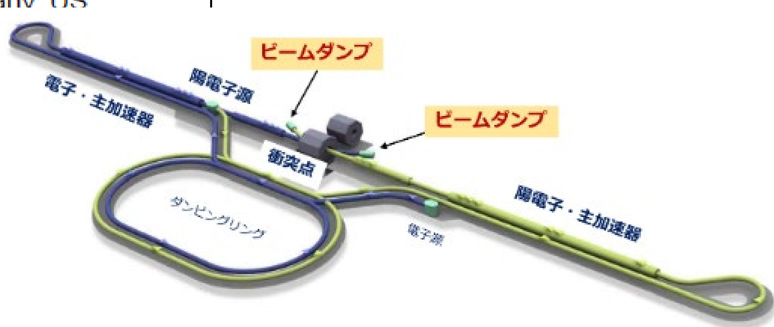
ILC international working group (2019)

(c) WPs Draft

The ILC International Working Group presented a technical preparation plan for the technical issues pointed out by the MEXT advisory panel and the Science Council of Japan.
The report outlines the necessary technical issues that should be addressed through international cooperation, as well as potential partners for international cooperation.

Component	Issue	Summary of tasks	Candidates for collaboration
SCRF Cavity	Mass production incl. automation	Performance statistics, mass production technology	France, Germany, US
	Cryomodule transport	Performance assurance after transport	France, German
Positron Source	Rotating target	Exchanging target, system design	CERN, France, Germany, US + industry-academia efforts
	Magnetic focusing system	System design	France, Germany, Russia, US
	Photon dump[23]	System design	CERN, Germany, US
Damping Ring	Fast kicker	Test of long-term stability, system design	CERN, Italy
	Feedback	Test at SuperKEKB	Italy
Interaction Region	Beam focus/position control	Test of long-term stability	CERN, UK
Beam Dump	Total system	System design	CERN, US
	Beam window, cooling water circulation	Durability, exchangeability, earthquake-resistance	CERN, US + industry-academia efforts

Report is available from
https://www.kek.jp/ja/newsroom/2019/10/02/1000/
Based on this, the IDT-WG2 discussed the issues.



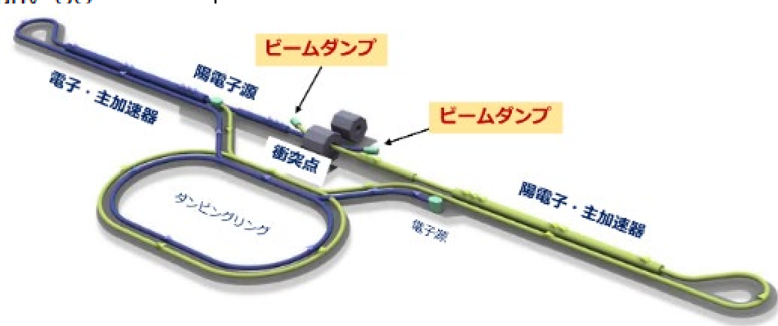
ILC国際ワーキンググループ（2019年）

Draft

ILC国際ワーキンググループにおいて、文部科学省の国際リニアコライダー（ILC）に関する有識者会議及び日本学術会議所見で指摘された技術的課題に関して、技術準備計画を示した。
報告書には、国際協力で進めるべき必要な技術課題と国際協力先の候補がまとめられている。

Component	Issue	Summary of tasks	Candidates for collaboration
超伝導空洞 SCRF Cavity	Mass production incl. automation	Performance statistics, mass production technology	France, Germany, US
	Cryomodule transport	Performance assurance after transport	France, German
陽電子源 Positron Source	Rotating target	Exchanging target, system design	CERN, France, Germany, US + industry-academia efforts
	Magnetic focusing system	System design	France, Germany, Russia, US
	Photon dump[23]	System design	CERN, Germany, US
ダンピングリング Damping Ring	Fast kicker	Test of long-term stability, system design	CERN, Italy
	Feedback	Test at SuperKEKB	Italy
衝突点 Interaction Region	Beam focus/position control	Test of long-term stability	CERN, UK
ビームダンプ Beam Dump	Total system	System design	CERN, US
	Beam window, cooling water circulation	Durability, exchangeability, earthquake-resistance	CERN, US + industry-academia efforts

ILC国際ワーキンググループ報告書の提言より
https://www.kek.jp/ja/newsroom/2019/10/02/1000/
これを基に、IDT-WG2で検討を進めた。



Technical preparation

(c) WPs Draft

The IDT-WG2 discussed the technical issues pointed out by the MEXT advisory panel and the Science Council of Japan (SCJ), and summarized them in the "Technical Proposal Document" (TPD).

ILC Pre-lab

- ***SRF*** ~41MILCU 285 FTE-yr
  - 実際の空洞・モジュール製造
    - WP-1 Cavity production
    - WP-2 Cryomodule assembly
  - WP-3 Crab cavity
- ***e− source*** ~2.5MILCU, 6 FTE-yr
  - WP-4 Electron source
- ***e+ source*** ~6MILCU, 15FTE-yr
  - ***Undulator scheme***
    - WP-5 Undulator
    - WP-6 Rotating target
    - WP-7 Magnetic focusing
  - ***e-Driven scheme***
    - WP-8 Rotating target
    - WP-9 Magnetic focusing
    - WP-10 Capture cavity
    - WP-11 Target replacement
- ***DR*** ~2.5MILCU, 30FTE-yr
  - WP-12 System design
  - WP-13 Collective effect
  - WP-14 Injection/extraction
- ***BDS*** ~2MILCU, 16FTE-yr
  - WP-15 Final focus
  - WP-16 Final doublet
- ***Dump*** ~3MILCU, 12FTE-yr
  - WP-17 Main dump
  - WP-18 Photon dump

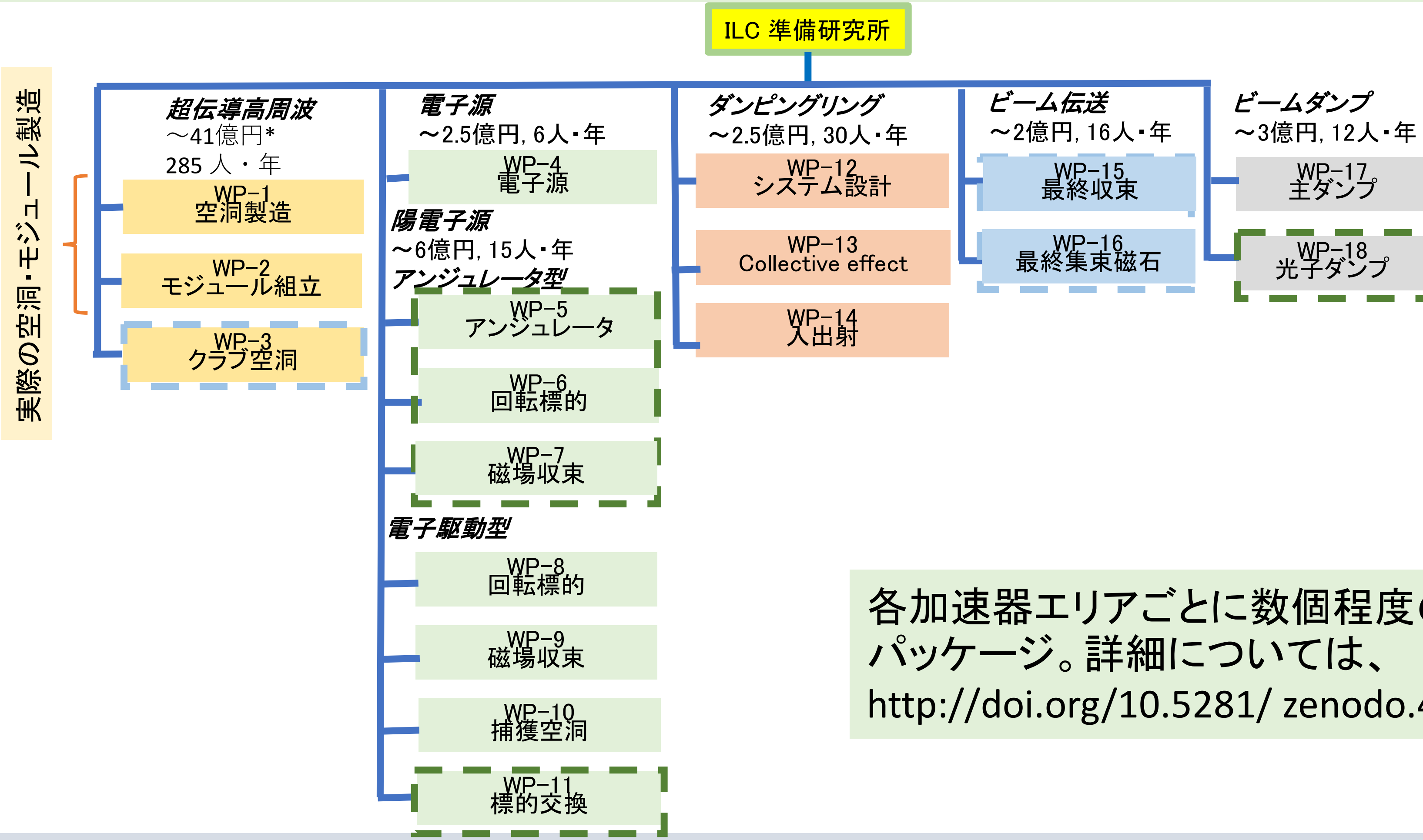
For detail,
http://doi.org/10.5281/ zenodo.4742018

- The technical proposal was reviewed by a review committee (chair:Tor Raubenheimer (Director of Accelerator Division, SLAC National Accelerator Laboratory).
- The total global cost of the project is about 60 MILCU* and about 360 FTE-year. (This does not include the cost of the infrastructure for the WPs.)
- The cost will be shared internationally as in-kind contribution.

Draft

技術課題に関する取り組み

文科省有識者会議や日本学術会議で指摘された技術的課題などについててIDT-WG2で議論を行い、「技術課題提案書」(TPD)に世界全体で物納貢献するワークパッケージ(WP)としてまとめた。



各加速器エリアごとに数個程度のワークパッケージ。詳細については、http://doi.org/10.5281/ zenodo.4742018

- ●技術課題提案書は、Tor Raubenheimer氏(SLAC国立加速器研究所、加速器部門・加速器研究系研究主幹)を委員長とするレビュー委員会で審議された。
- ●世界全体で約60億円*、360人・年程度を分担する。(ここには、WP実施に必要となる基盤設備の整備費用は含まれていない。)(*ILCU(2013年の米ドル)を100円と換算した金額)
- ●物納貢献として国際的に分担される。

- Hybrid or full-remote
- https://agenda.linearcollider.org/event/9211/
  - Please register!
- 26-29 October 2021
- Parallel sessions are available
  - Topical workshop? (such as CM design,crab cavity, etc.)
  - Some dedicated discussion?
  - Please start discussion at each group!

ILCX2021 ILC Workshop on Potential Experiments

ILC Workshop on Potential Experiments (ILCX2021)

26-29 October 2021
KEK Tsukuba campus (in the case of hybrid meeting) or fully online
Asia/Tokyo timezone

Enter your search term

Getting started - registration! Do you have a new topic or idea for a potential experiment using ILC facilities?? Please submit your idea via "Registration" page.

Overview
Registration
Sessions
Accommodation
Organization

ILCX2021 Local Organizing Committee
ilcx2021@ml.post.kek.jp

The ILC International Development Team (IDT) will hold the ILC Workshop on Potential Experiments (ILCX) from October 26 to 29, 2021.

With the anticipation that the ILC will be realized in the near future, we would like to expand discussions about all possible experimental opportunities at the ILC laboratory. The workshop will address all the aspects of the collider program at the Interaction Point (IP), including, in addition to the established concepts, ideas for new detector technologies or concepts, detector performance and physics reach, software and computing, and theoretical developments. In addition, we will discuss possible beam dump experiments, forward detectors near the IP, off-axis far detectors, experiments with extracted beams for particle physics and other areas of science, including e.g. nuclear physics, or condensed matter physics. Some of these ideas will require additional infrastructure and civil engineering, and therefore need to be incorporated into the ILC site planning.

The workshop organizing committee is the Executive Board of IDT, and the program committee is the Steering Group of Working Group 3 (Physics and Detector). Due to the uncertainties with the COVID-19 situation, final decision between a hybrid meeting on the KEK site vs a fully online meeting will be made *sometime in late August or early September.*

In the case of hybrid meeting, a visit to ILC-related facilities (STF, ATF etc.) at KEK Tsukuba campus is being arranged during the workshop, while an excursion to Iwate and the candidate ILC site tour are being planned on Oct 25 if the COVID-19 situation permits.

ILCX2021 is hosted by IDT, KEK and JAHEP ILC Steering Panel.