

IDT-WG2 report

KEK / IDT-WG2 Shin MICHIZONO (KEK)

- LCWS2024
- ITN meeting (July 12, 8AM-10AM)
- Next IDT-WG2

LCWS2024

~340 participants (including remote connection)



ITN meeting (12th July)

- ITN meeting after LCWS2024 (12th July, 8AM-10AM (in JST), hybrid)
 - the **second meeting** (following the last ITN information meeting at CERN in October 2023)

Start	End	Talks	Contents	Speaker
8:00	8:05	Welcome		Tetsuyuki Muramatsu
8:05	8:13	ITN general		Shin MICHIZONO
8:13	8:21	SRF Asia	WPP1-2	Kirk YAMAMOTO
8:21	8:29	SRF Europe	WPP1-2	Enrico Cenni
8:29	8:37	Sources Undulator/Target	WPP6/7	Gudrid Moortgat-Pick
8:37	8:45	Sources e-Driven	WPP8-11	Yoshinori Enomoto
8:45	8:53	Nanobeam inj./ext.	WPP14	Phil Burrows
8:53	9:01	Nanobeam ATF	WPP-15	Angeles Faus-Golfe
9:01	9:09	Nanobeam Dump	WPP-17	Nobuhiro Terunuma
9:09	9:29	ITN organization		Tatsuya NAKADA
9:29	10:00	Discussion		

ITN in progress

For **WPP-1&2 (SRF cavity, CM)**, we started technical discussions with researchers in Europe and Korea. Single cell cavity production in Korea/Europe will start soon.

JAI (UK) started WPP-13 (DR Injection/extraction, **synergy with Diamond Light Source upgrade**)

For **WPP-15 (Final Focus System)**, European and Korean researchers have joined to the ATF experiments since 2023.

In the U.S., part of the ILC Technology Network (ITN) activities on **SRF and positron sources** have started as the U.S.-Japan Science and Technology Cooperation Program.

WP-prime 1: SRF Cavity

(Scoping the Industrial-Production Readiness)

Referring European XFEL and LCLS-II experiences

- Research with single-cell cavities to establish the best production process including:
 - Advanced Nb sheets production method
 - Advanced surface treatment recipe
- Globally common design with compatible High Pressure Gas Safety (HPGS) regulation
- 24 nine-cell cavities are to be developed for industrial-production readiness
 - 8 cavities in each region
- Production process encouraged to be optimized in each region
- Cavity performance expected: $f_{\text{acc}} = < 35 \text{ MV/m} >$ ($\eta = 20\%$), $Q_L = 1.0 \times 10^{10}$, $\text{Yield} = 300\%$
- RF performance/success yield to be examined (including 2nd pass and further)
 - 3rd pass to be examined if effective

	Americas	Europe	JP/Asia
single-cell	2	2	2
nine-cell	8	8	8

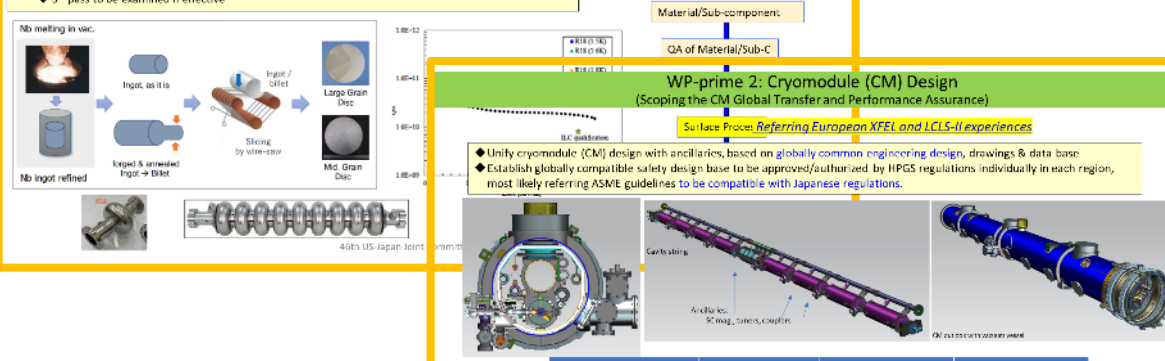
Material/Sub-component: QA of Material/Sub-C

WP-prime 2: Cryomodule (CM) Design

(Scoping the CM Global Transfer and Performance Assurance)

Surface Process Referring European XFEL and LCLS-II experiences

- Unify cryomodule (CM) design with ancillaries, based on globally common engineering design, drawings & data base
- Establish globally compatible safety design base to be approved/authorized by HPGS regulations individually in each region, most likely referring ASME guidelines to be compatible with Japanese regulations.

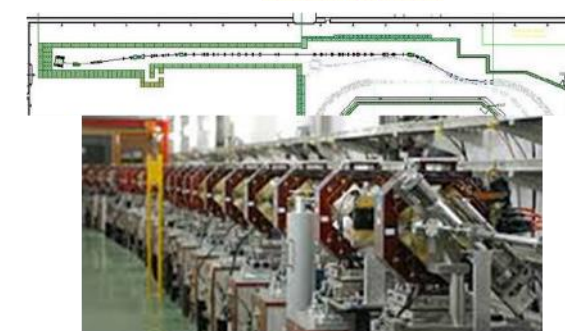


Region Regulation	Americas ASME	Europe EN, TÜV	Japan/Asia JP-HPGS Act
CM tech. design base	LCLS II	Euro XFEL	KEK SPring-8, ASI IFMIF
ILC CM design	Common CM design globally compatible to HPGS regulation in all regions, and most likely ASME guidelines to be compatible with Japanese regulations.		

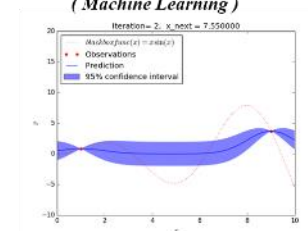
WP-prime 15: System design of ILC FFS

ATF collaboration

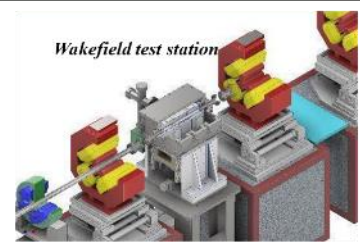
- ATF2 beamline is the **only existing test accelerator in the world** to test the final focus system (FFS) of linear colliders.
- The following 3 research topics are important to be pursued at the ATF:
 - wakefield mitigation
 - correction of higher-order aberration
 - training for ILC beam tuning
- The technical research at ATF2 beamline has proceeded and should continue to be based on the **ATF international collaboration**, or its extension (**welcome to new collaborators**).




Maximum search algorithms to be applied to beam tuning (Machine Learning)



Wakefield test station



Octupole magnets for higher-order aberration



46th US-Japan Joint Committee Meeting

ITN meeting (12th July)

- ~ 40 joined to the meeting (including remote participation)
- Next meeting will be held in this year



Next IDT-WG2 meeting : Sep. 3, 2024 (6 weeks later)