

# 40<sup>th</sup> Meeting of SRF Group in IDT/WG2

- ✓ Recent progress of SRF 5-year plan at KEK and global collaboration for ITN (Kirk)
- ✓ Others (if any)

Attendees: A. Yamamoto, K. Umemori, D. Delikaris, S. Steiner, P. Burrows, Kirk

<https://agenda.linearcollider.org/category/256/>

# Leaders for each sub-group at KEK (updated)

<b>Sub-group</b>	<b>Leader</b>
Drawing	Takeshi Dohmae
Cavity	T.B.D.
Frequency tuner	Mathieu Omet
Power coupler	Kirk
Magnetic shield	Ryuichi Ueki
SCQ magnet (+BPM)	Yasushi Arimoto (Hitoshi Hayano)
Clean work/Vacuum work	(temporarily) Kirk
Cryomodule	Kirk
Infrastructure at COI	Shinichiro Michizono
RF	Toshihiro Matsumoto
Cryogenics	Hiroataka Nakai/Kota Nakanishi/Hiroataka Shimizu
Cavity fabrication/Material preparation	Takayuki Saeki/Takeshi Dohmae
High Pressure Gas Safety Act	Kensei Umemori/Takayuki Saeki/Takeshi Dohmae

# Recent progress of SRF 5-year plan ①

- Japan (KEK)
  - Cavity
    - FG 9-cell cavity is under fabrication, negotiation with local government and KHK is under progress, may be approved in Feb
    - Six 1-cell cavities (FG/MG) will be produced by KEK in-house, and VT will start after delivery in Jan
    - KEK sent some MG disks to vendors in EU for press-testing
    - KEK is preparing necessary Nb material for Eddy Current Scanning (ECS) at DESY
    - KEK started the discussion with a domestic vendor to produce 9-cell cavities in next FY
  - Power coupler
    - Drawing work and specification document are under progress
    - Ceramic samples were ordered for quality check of brazing, thermal cycle test, TiN coating test, etc.
    - RF simulation is under progress between FNAL and KEK within the framework of the US-Japan Science and Technology Cooperation
  - Tuner
    - Drawing work is under progress
    - Discussion with FNAL is under progress for rental of a set of cavity/tuner/helium tank within the US-Japan
    - Mechanical simulation for LFD is under progress
  - Magnetic shielding/Demagnetization
    - Demagnetization test with a small cryo-vessel is under preparation
    - Drawing work of magnetic shielding is under progress
    - Discussion with a domestic vendor is under progress
  - SC-Q magnet
    - Discussion with a domestic vendor is under progress

# Recent progress of SRF 5-year plan ②

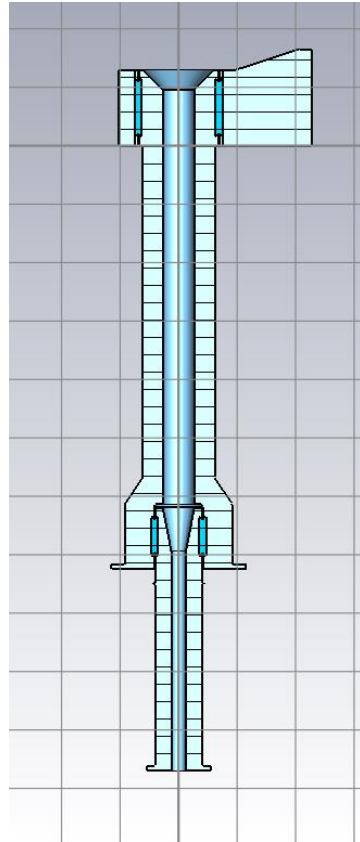
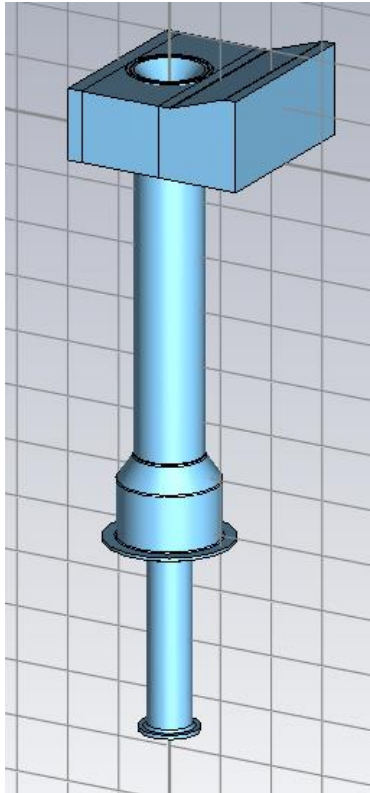
- Japan (KEK)
  - Clean work/Vacuum work
    - Design of mock-up cavities (will be used for training of cavity string assembly) was almost done, waiting for procurement
    - Remote control system for ionized gun and dust monitor will be completed soon, will be merged with robot arm system
    - Regular meeting on robotics with CEA and FNAL has been held
  - Cryomodule
    - Drawing work is under progress
    - Discussion with domestic vendors is starting
  - Infrastructures
    - Cavity Fabrication Facility
      - CFF group is preparing for new work area, install a new clean room and some devices
    - Cryogenics
      - They started the preparation for change request to discuss with local government
    - CM hanger
      - Currently under construction for improvement
    - CM test bunker
      - The design completed, the cost estimation done

# Global collaboration and recent progress for ITN

- Overseas
  - Americas
    - Waiting for their decision after the conclusion by P5 will open this week
  - Asia
    - Korea University and PAL newly joined the ITN, and KEK will explain for them in 14/Dec
  - Europe
    - CERN, CEA and INFN are considering production of two 1-cell cavities, will start from 2024
      - This depends on when the budget and the Nb material will be transferred from KEK to EU
    - CEA and INFN are discussing with DESY how to contribute to ITN
    - DESY is preparing for ECS
      - Free of charge for EU
      - Americas and Asia are under discussion
    - CIEMAT and IFIC are discussing with KEK to produce SC-Q magnet and BPM system
    - IFIC and IJCLAB newly joined the ITN, they will discuss internally in EU

# Recent progress of power coupler

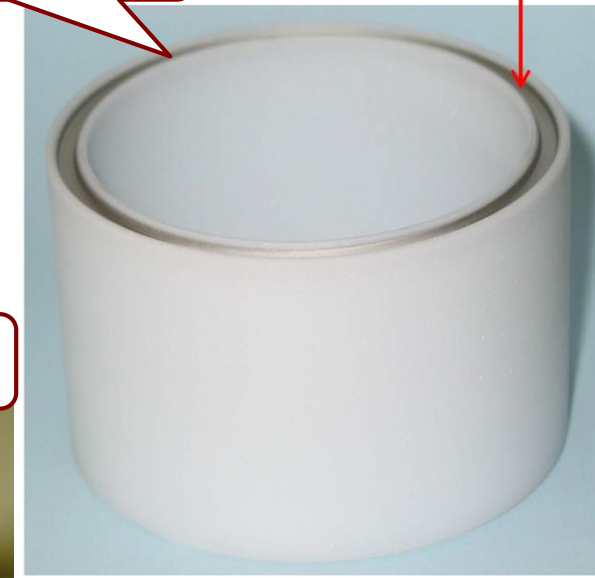
RF simulation is under progress



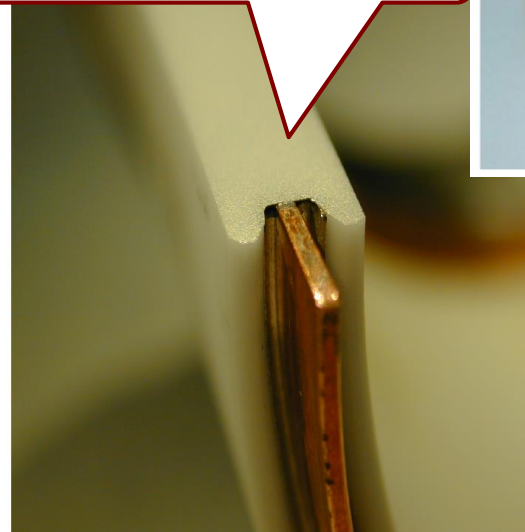
Courtesy of R. Katayama

Metalized ceramics

ceramic with metallization



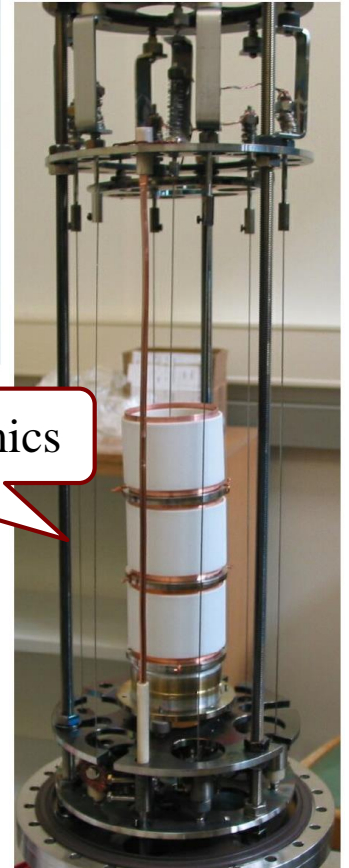
Quality check of brazing



cut-view of the ceramics to copper collar brazing: braze is very regular.

TiN coating on ceramics

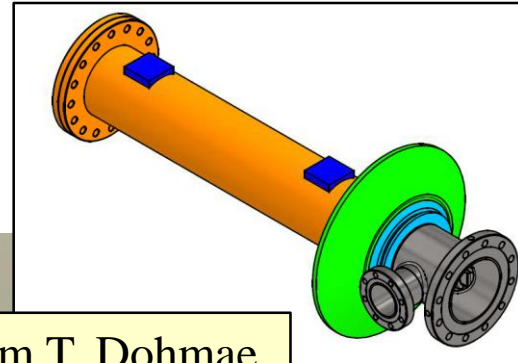
Courtesy of D. Kostin



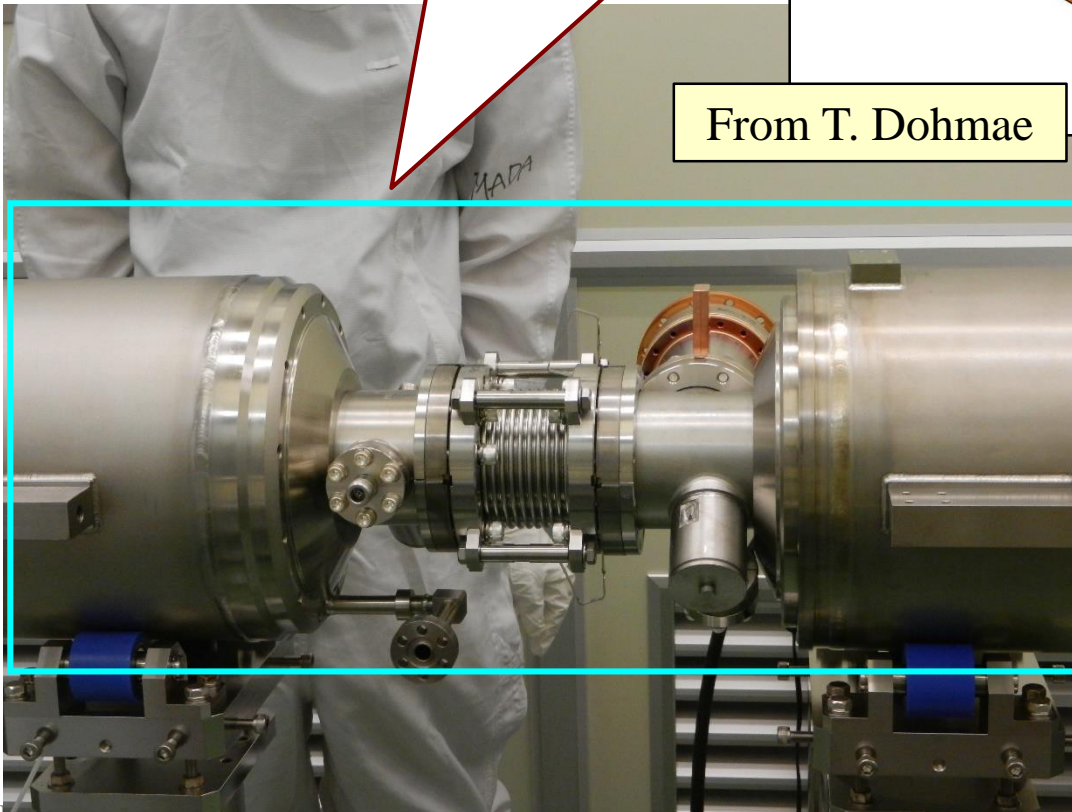
# Design/Production of mock-up cavities

KEK will introduce mock-up cavities for training of cavity string assembly.

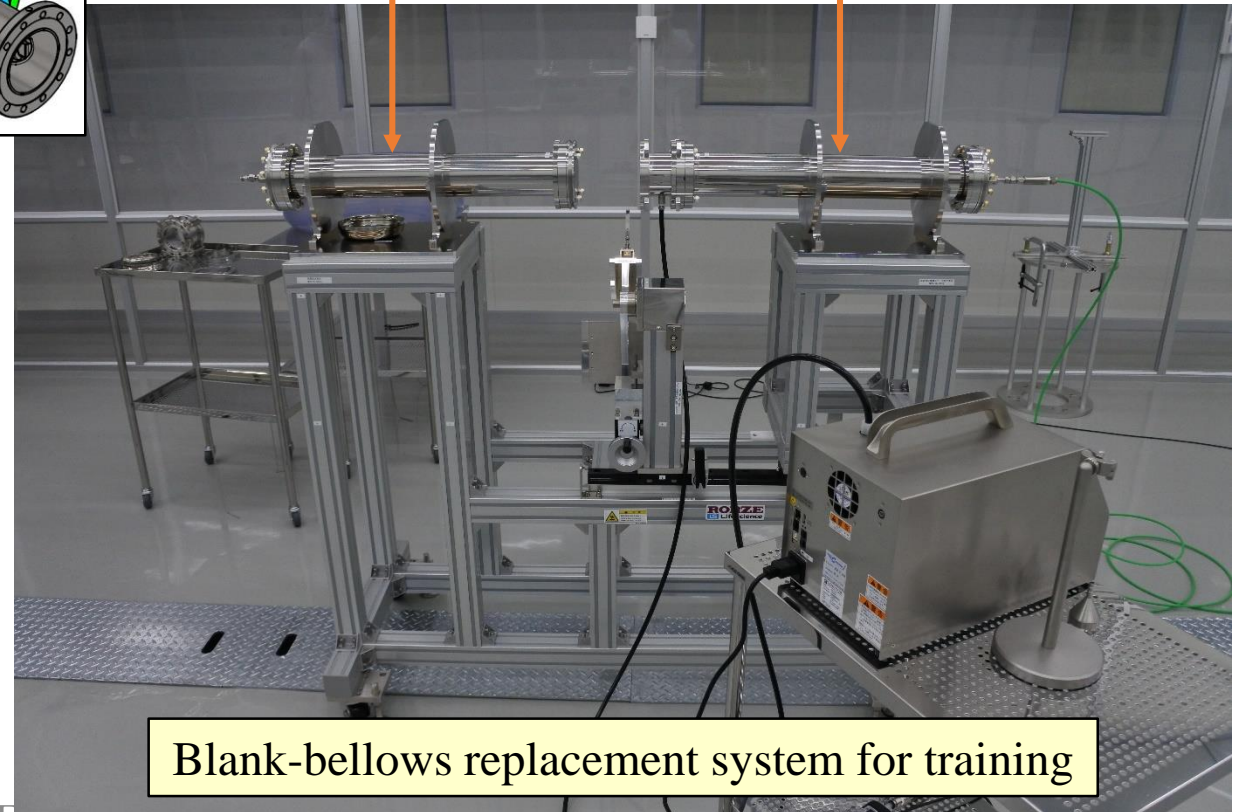
We designed mock-up cavities for training of cavity string assembly



From T. Dohmae



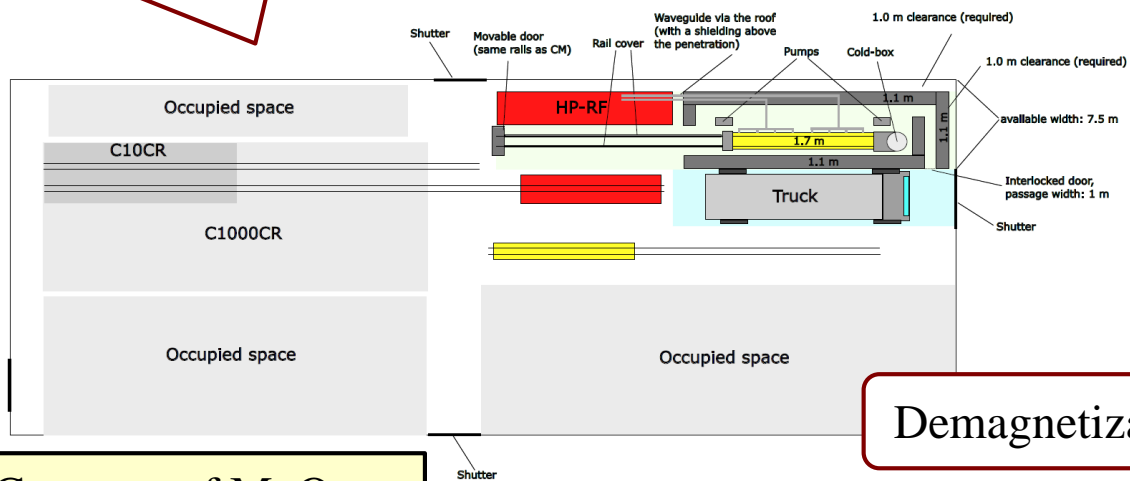
We will replace dummy cavities with mock-up ones



Blank-bellows replacement system for training

# Recent progress of infrastructure at COI

Layout of CM test bunker at COI



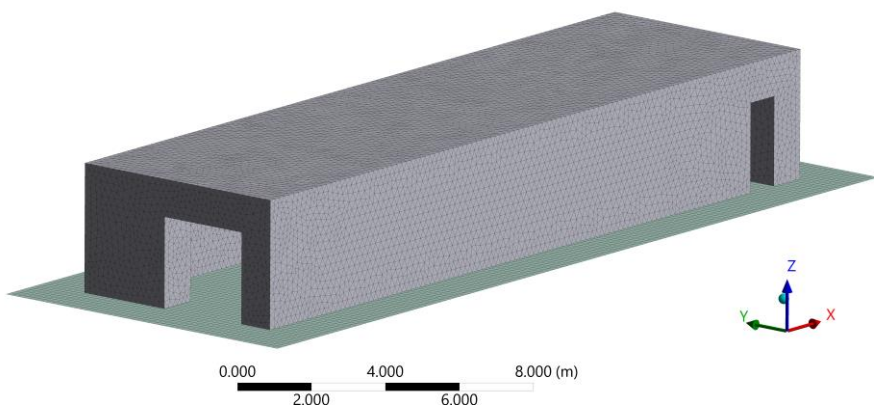
Courtesy of M. Omet

Tuner work area

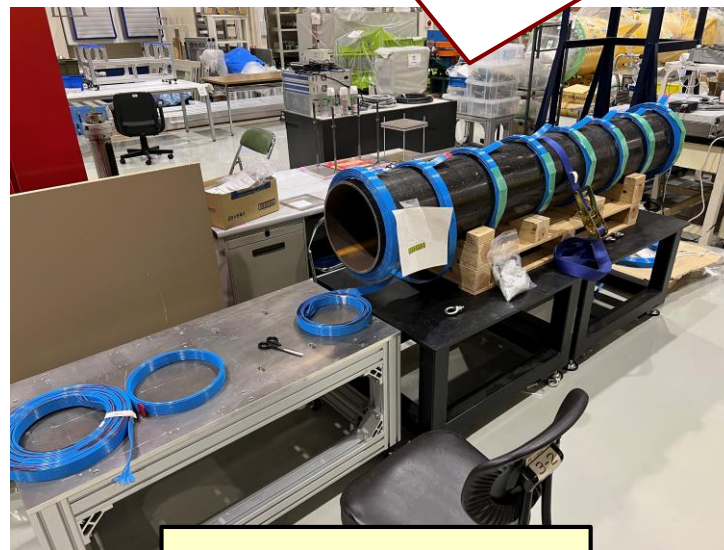


Courtesy of M. Omet

Demagnetization study using mock-up CM



Courtesy of H. Araki



Courtesy of R. Ueki

CM hanger



Courtesy of H. Hayano





# Meeting/Conference schedule

Meeting #	Date	Contents
40	5/Dec	Recent progress of SRF 5-year plan and global collaboration for ITN
	5~8/Dec	TTC Meeting 2023 @FNAL, US
	8~11/Jul/2024	LCWS2024 @Tokyo, Japan



<https://agenda.linearcollider.org/event/10134/>