



# Summary and Status of HL-LHC Collaborations

From the HL-LHC Collaboration Office  
M. Zerlauth on behalf of the Collaboration Office



14<sup>th</sup> HL-LHC Collaboration Meeting – Genoa – 7-10 October 2024

HIGH LUMINOSITY LHC

## 14<sup>th</sup> HL-LHC COLLABORATION MEETING

### GENOA, ITALY, 7-10 October 2024

Jointly organised by **INFN** and **CERN**, the 14<sup>th</sup> HL-LHC Collaboration Meeting will take place in person in **Genoa, Italy** from 7<sup>th</sup> to 10<sup>th</sup> October 2024. This edition will provide the occasion to showcase the successful production and validation of the first series D2 magnets, produced by ASG in Genoa as an in-kind contribution

by **INFN** (Italy), as well as the completion of production of the MgB<sub>2</sub> wires for the superconducting link by ASG. Based on the traditional programme with plenary and work package parallel sessions, this meeting will serve as a technical update forum for the 8<sup>th</sup> Cost and Schedule Review, scheduled for

11<sup>th</sup> to 14<sup>th</sup> November 2024. The main objectives will be to update all HiLumi collaborators on the advancement of the series production of components for the project, to showcase the status of the IT String test stand installation at CERN, and to update all collaborators on the latest schedule changes.



#### CERN – Organizing Committee

**Oliver Brüning** Project Leader  
**Markus Zerlauth** Deputy Project Leader  
**Cécile Noels** Project Office & Communications  
**Florence Thompson** Project Office & Communications

#### INFN – Local Organizing Committee

**Andrea Bersani** - Communication Officer  
**Barbara Caiifi** - MBRD Deputy Technical Coordinator  
**Mirko Corosu** - IT Manager  
**Stefania Farinon** - MBRD Technical Coordinator  
**Filippo Levi** - Deputy Conference Coordinator  
**Alessandra Pampaloni** - Conference Coordinator  
**Marco Statera** - HQ Corrector Technical Coordinator

For more details and registration : [HL-LHC.Secretariat@cern.ch](mailto:HL-LHC.Secretariat@cern.ch) / [hilumihc.web.cern.ch](http://hilumihc.web.cern.ch)

# Collaboration Agreements and Procurement I

- All collaboration agreements **are signed and are being executed**.
- Procurement being prepared (**see presentation from H. Garcia Gavela**).
- Since last HL-LHC Collaboration Meeting (in 2023)
  - KN5175/TE/HL-LHC ADD.22 with **INFN**, September 2023 (Extension).
  - Amendment 2 to KE3297/BE/HL-LHC with **UNIMAN**, September 2023 (Extension).
  - KR5708/TE/HL-LHC ADD.4 with **KEK**, December 2023 (QHPS contribution).
  - Amendment 2 to KE3797/TE/HL-LHC with **CIEMAT**, January 2024 (updated production baseline).
  - Amendment 1 to KE5162/TE/HL-LHC with **Uppsala University**, February 2024 (updated invoicing).
  - KR5904/SY/HL-LHC ADD.5 with **KEK**, May 2024 (High Power RF contribution).
- Notes on Invoices
  - **CERN-UK Phase 1**: one invoice missing (RFD repair).
  - **CERN-UK Phase 2**: no invoices yet.

## Collaboration Agreements and Procurement II

- Deliberations for **possible additional future contributions**
  - Following **Brazil's** accession to CERN Associate Membership, interest from CNPEM-Brazil for possible personnel contributions to HL-LHC.
  - Expression of interest from **Greece** for personnel contribution to HL-LHC.
  - Project has already shared some **possible areas of contributions** incl. IT String operation, electro-mechanical assemblies and SAT, (de-)installation activities.

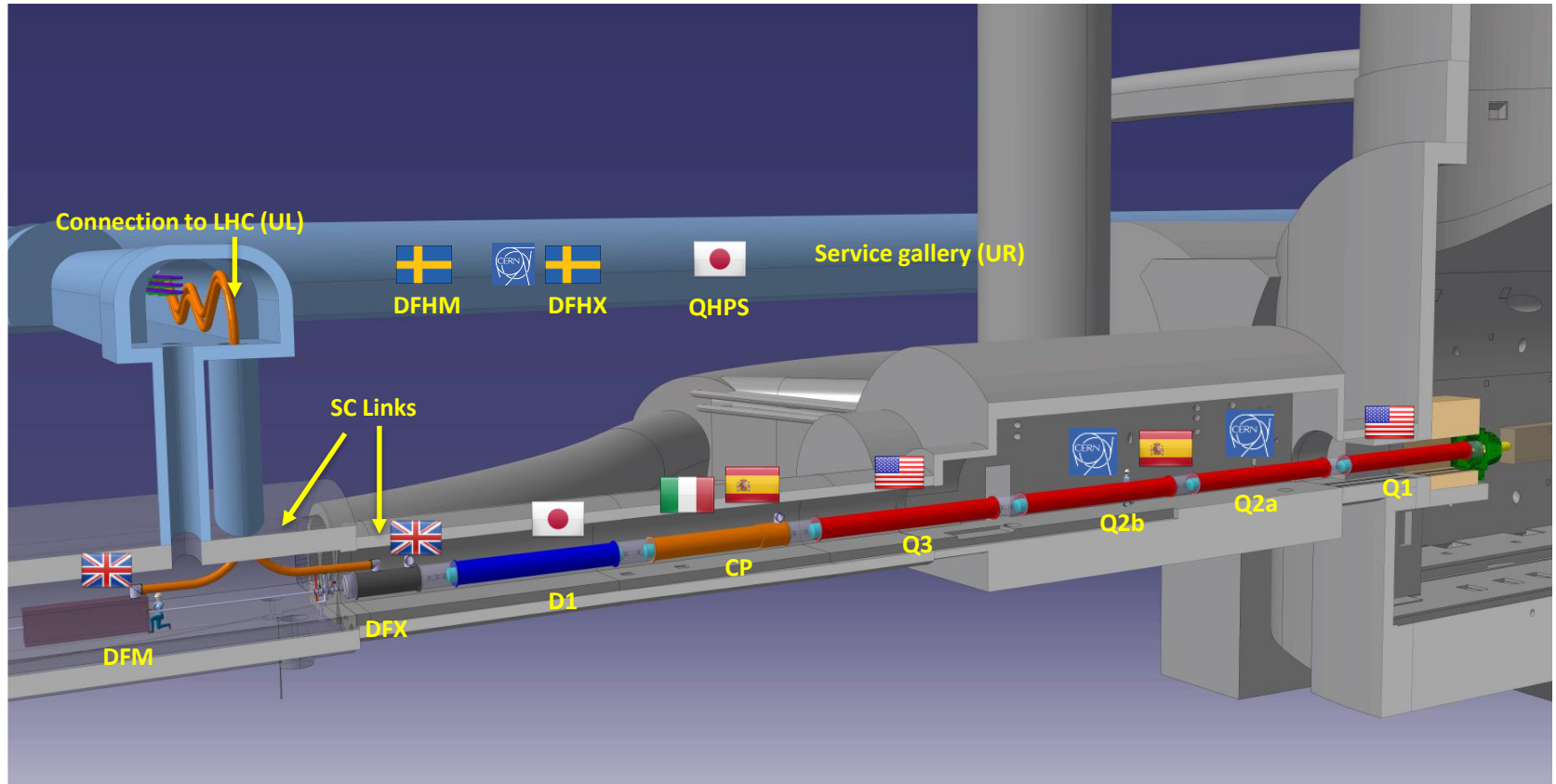
# Collaboration with Japan / KEK

- At its 218th Session on 26 September 2024, CERN Council decided to grant **Japan Observer status in respect of the HL-LHC** project, for the duration of the construction and operation of the HL-LHC, in addition to the Observer status Japan already holds in respect of LHC.
- Contributions to the HL-LHC project**
  - In-kind contributions** amounting to total estimated core value of 23 MCHF:

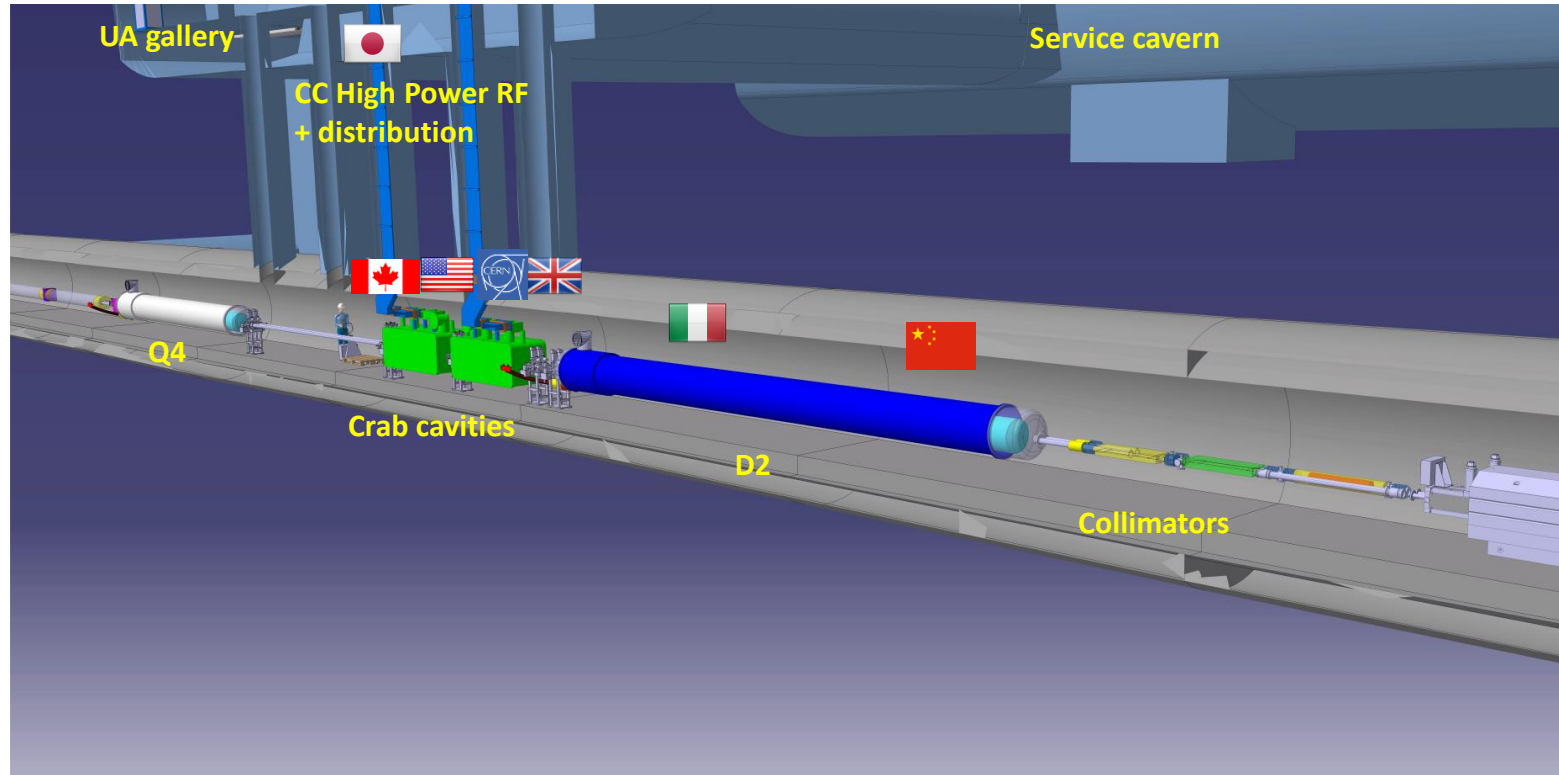
Superconducting separation/recombination (D1) dipole magnets	}	ICA-JP-010+KN4074
Quench Heater Power Supplies (270 units for triplet and matching sections)		KR5708
Quench Heater Power Supplies (360 units for standalone quadrupoles)	}	KR5904
Crab Cavity Power amplifier system (transmitter, IOTs, trolleys)		
RF power distribution (waveguides, coaxial lines, circulators, loads)		

- Financial contribution** with a core value of 2 MCHF to be paid fully in cash (Agreement to be signed).

# The Inner Triplet Region: Collaborations



# The MS (Matching Section) Region: Collaborations



# Collaboration Steering Committee Meetings

## Since the 2023 HL-LHC Collaboration Meeting

- 8 Steering Committee meetings held (AUP, CIEMAT, IHEP, INFN, KEK, TRIUMF, UNIMAN, UPPSALA)
- **During HL-LHC Collaboration Meeting (Genoa, 7-10 October 2024)**
  - INFN / Italy                      9 October 2024
  - CIEMAT / Spain                10 October 2024
  - FNAL / US                        10 October 2024
  - TRIUMF / Canada               10 October 2024
- **Following HL-LHC Collaboration Meeting**
  - IHEP / China                    December 2024
  - KEK / Japan                      Q1 2025
  - UNIMAN / UK                    April 2025
  - Uppsala / Sweden               April 2025

Numerous other recurrent technical meetings within the work-packages!

# In-kind Contributions (September 2024)

	Country	Agreement	Institute	Brief description of the collaboration
<b>R&amp;D</b>	France	KE2736	CEA	Thermal Design of Superconducting High Field Magnets at CERN
	UK	KE3298	Manchester	Beam instrumentation
	UK	KE3299	Manchester	Cold powering: DFBX for String
	UK	KN3362	ASTeC+Dundee	Laser treatment prototype (LESS)
<b>Prototypes and BASELINE</b>	Italy	KE3085	INFN	High-order corrector magnets + prototypes
	Spain	KE2292	CIEMAT	Nested orbit correctors + prototypes
	Spain	KE3797	CIEMAT	Nested orbit correctors + prototypes
	China	KN4154	IHEP	D2 Correctors
	Sweden	KE3082	Uppsala Univ.	Cold testing of corrector magnets and crab cavities
	Japan	ICA-JP-010+KN4074	KEK	D1 magnet model and cold mass
	Italy	KE2291	INFN	D2 model + prototype + magnet
	Italy	KE3084	INFN	D2 model + prototype + magnet
	Italy	KE4417	INFN	D2 model + prototype + magnet
	USA	P131	Several	10 Crab Cavities + HOM Couplers
	USA	P131	Several	Triplet magnets
	Canada	P095	TRIUMF	5 RFD Crab-cavities cryomodules (including TE-VSC contribution)
	Sweden	KE5162	Uppsala Univ.	DFHM and DFHX 8+2 units
	UK	KE5170	SOTO	DFM and DFX 7+2 units
	UK	KE5168	ASTeC+Lancaster	4 DQW Crab-cavities cryomodules (including TE-VSC contribution)
	UK	KE5169	LIV+RHUL	Beam instrumentation EO-BPM
	UK	KE5169	Liverpool	Beam Instr. For Hollow e-lens
	UK	KR5171	Dundee	Laser treatment final (LESS)
	Serbia	No contract num	Ministry	Magnets and CC jacks
	Japan	KR5708	KEK	Quench Heater Power supplies
Japan	KR5904	KEK	High Power RF and distribution system for Crab cavities	

Total contributions  
for ~107 MCHF

Incoming: Japan financial contribution with a core value of 2 MCHF to be paid fully in cash



# HL-LHC CB Newsletter Highlights

<https://hlcb-newsletter.web.cern.ch/>



HL-LHC Collaboration Board Members at Vancouver



First US inner triplet cryoassembly connected to CERN test station



MCBXFA1 (CIEMAT) at CERN

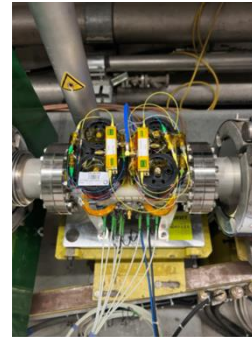


KEK D1 prototype under test at CERN.

First series magnet MBRD1 (INFN-Genoa) at CERN, with two D2 correctors from IHEP in background



Magnetic shields & helium tank materials ready for first two bare RFD cavities (Zanon, IT)



Electro-Optical BPM prototype (RHUL, UK) installed on SPS beamline



QHDS pre-series units (Japan) delivered to CERN

# Conclusions

- International collaborations continue to play a vital role for the HL-LHC project.
  - Series production in full swing for all existing collaboration agreements.
  - Detailed status of collaborations will be presented throughout this HL-LHC Collaboration Week.
- Some Amendments to Agreements are being prepared for schedule reasons to cover extensions.
- Finalised contributions (in kind and financial) from Japan / KEK.
- Steering Committee meetings being planned for the next 7 months.
- Highlights of HL-LHC collaborations recorded in newsletter.

*Collaboration Office is available to provide support across WPs*