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**EURO-LABS**

EUROpean Laboratories for Accelerator Based Science

HORIZON-INFRA-2021-SERV-01-07 Project EURO-LABS

 Milestone report

Work on Service Improvements Started

milestone: MS19

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Abstract:

*The present document reports on the service improvements planned for the RI Facilities participating to the Work Package 3 of EURO-LABS. Details of the proposed activities, budget and schedule are presented.*

EURO-LABS Consortium, 2023

For more information on EURO-LABS, its partners and contributors please see <https://web.infn.it/EURO-LABS/>

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Executive summary

*The key goal of the EURO-LABS project is to provide Transnational Access (TA) to major Research Infrastructures (RI) in Europe. WP3 groups thirteen facilities focused on High-Energy Accelerator Research. The document details the proposed work to improve the existing facilities to the profit of the users. The expected budget, resources and schedule for the planned activities is presented.*

# Introduction

EURO-LABS is a network of 33 research and academic institutions (25 beneficiaries and 8 associated partners) from 18 European and non-EU countries, involving 47 Research Infrastructures within the Nuclear physics, Accelerators and Detectors pillars. In this large network, EURO-LABS will ensure diversity and actively support researchers from different nationalities, gender, age, and variety of professional expertise.

EURO-LABS aims at fostering the sharing of knowledge and technologies across scientific fields to enhance synergies and collaborations between the RIs of the Nuclear and High Energy communities. Within EURO-LABS the Work-Package 3 (WP3) will provide Transnational Access (TA) to Research Infrastructures for Accelerator R&D.

WP3 will provide TA to a broad spectrum of installations, to test concepts for future accelerators, based on improving the present facilities, and for R&D studies for future colliders like CERN/FCC or the Muon Collider. These facilities will provide beam lines for testing advanced accelerator materials, superconducting or normal Radio-Frequency cavities, magnets and acceleration schemes. These tests use different particles and energies (low-energy protons, low-energy electrons, ultra-soft electron bunches and high-intensity high-energy electrons and could also have connections to industrial applications.

# Hiradmat - cern

*Paragraph 1 : Short description of the facility, justification of the proposed improvement*

|  |
| --- |
| Photos or graphs of the facility relevant to the service improvements |
|  |

Figure - Graphs or photos to show or justify the proposed improvements

*Paragraph 2 : Details on the planned activities*

*Paragraph 3 : Budget planning*

*Paragraph 4 : Schedule*

# FREIA – UU

|  |
| --- |
| Photos or graphs of the facility relevant to the service improvementsAnticryostat |
|  |

Figure - Graphs or photos to show or justify the proposed improvements

* ***Anticryostat***: to be used in Gersemi’s magnet insert. Is a magnetic-measurement test bench to qualify superconducting magnets. It will measure the magnetic flux density field and field quality of superconducting magnets with a minimum of 50 mm diameter bore operated at cryogenic temperatures. It uses a rotating coil scanner working at room temperature and pressure.

This is custom-made equipment and a current project with CERN.

* ***A magnetic flux sensor for cavity testing***. This equipment would be used to measure the presence of low magnetic fields on the cavity during and after cooldown, if any. Could be placed at Gersemi or HNOSS.
* ***Solid state amplifier*** for cavity testing, for either HNOSS or Gersemi.
* ***LLRF*** for cavity testing, for either HNOSS or Gersemi.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Equipment** | **Specific Item** | **Price/Unit** | **# Units** | **Price Total** |
| Anticryostat |  | 123 k€  | 1 | 123 k€ |
| Magnetic Flux sensor | 3-axis sensor head | 2 850 GBP | 3 | 8 550 GBP |
| Cryogenic cable (5m) | 255 GBP | 765 GBP |
| Power supply and display unit | 2 555 GBP | 7 665 GBP |
| RF Amplifier | 0.7-2.7 GHz, 126-158 W | 15 813 € | 1 | 15 813 €  |
| Digital FPGA\* | Up to 6 GHz | 718 000 SEK | 1 | 718 000 SEK |

*\* This equipment will not be part of the improvement services if the anticryostat is approved as being a service.*

|  |  |
| --- | --- |
| **Equipment** | **Schedule** |
| Anticryostat | Q4 2025 |
| Magnetic Flux sensor | Q3 2023 |
| RF Amplifier | Q3 2023 |
| Digital FPGA\* | Q1 2024 |

# INFN-LASA – IT

*Paragraph 1 : Short description of the facility, justification of the proposed improvement*

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| Photos or graphs of the facility relevant to the service improvements |
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Figure - Graphs or photos to show or justify the proposed improvements

*Paragraph 2 : Details on the planned activities*

*Paragraph 3 : Budget planning*

*Paragraph 4 : Schedule*

# INFN-THOR – IT

*Paragraph 1 : Short description of the facility, justification of the proposed improvement*

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| --- |
| Photos or graphs of the facility relevant to the service improvements |
|  |

Figure - Graphs or photos to show or justify the proposed improvements

*Paragraph 2 : Details on the planned activities*

*Paragraph 3 : Budget planning*

*Paragraph 4 : Schedule*

# CEa/lrfu-Synergium – fR

*Paragraph 1 : Short description of the facility, justification of the proposed improvement*

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| --- |
| Photos or graphs of the facility relevant to the service improvements |
|  |

Figure - Graphs or photos to show or justify the proposed improvements

*Paragraph 2 : Details on the planned activities*

*Paragraph 3 : Budget planning*

*Paragraph 4 : Schedule*

# KIT-ALFA(KARA – FLUTE) – GE

*Paragraph 1 : Short description of the facility, justification of the proposed improvement*

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| Photos or graphs of the facility relevant to the service improvements |
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Figure - Graphs or photos to show or justify the proposed improvements

*Paragraph 2 : Details on the planned activities*

*Paragraph 3 : Budget planning*

*Paragraph 4 : Schedule*

# CEA/LIDyl-LPA-UHI100 – FR

*Paragraph 1 : Short description of the facility, justification of the proposed improvement*

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| --- |
| Photos or graphs of the facility relevant to the service improvements |
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Figure - Graphs or photos to show or justify the proposed improvements

*Paragraph 2 : Details on the planned activities*

*Paragraph 3 : Budget planning*

*Paragraph 4 : Schedule*

# Annex: Glossary

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| Acronym | Definition |
| TA | Transnational Access |
| VA | Virtual Access |
| RI | Research Infrastructure |