

Annex. POSITIONS

1. Center: [LIPAc site - QST Rokkasho Fusion Institute \(Rokkasho, Japan\)](#)

Overall purpose

LIPAc, the Linear IFMIF Prototype Accelerator, is an accelerator using superconducting linac presently under installation and commissioning in Rokkasho Fusion Research Institute in Japan in the framework of the IFMIF/EVEDA project. The goal of the IFMIF/EVEDA project is to validate the technological concept of a Li (d,n) fusion relevant neutron source for materials testing. It is being implemented under the Broader Approach Agreement between Japan and EURATOM in the field of Fusion Energy Research running until December 2019.

LIPAc aims at running a deuterons beam of 9 MeV at 125 mA in Continuous Wave mode; this performance will break through present accelerator technologies frontiers. LIPAc will validate the technological concept of the 40 MeV accelerator of IFMIF-DONES.

We are looking for people interested to join the Integrated LIPAc Unit in Rokkasho to reinforce the international team in accelerator technologies and to support the team onsite technically, ensuring the safe and efficient execution of the experimental campaigns.

1.a. 1 position for Accelerator Control System

Task descriptions

- To assist in the hardware commissioning tasks in Rokkasho in particular in integrating as a whole the different Local Control System into the Central Control System, beam operation, instrumentation performance, and machine system.
- To participate to the beam commissioning and the operation of the LIPAc, including the operation of the main sub-systems (ion source, RFQ, MEBT, HEBT, superconducting linac, and associated diagnostics).
- To participate in the engineering design of the new control system in the frame of enhancement activities of the LIPAc Control System (e.g. Engineering, Follow-up, Procurement, Installation ...).
- To assist the Maintenance leader in implementing and following up the maintenance plan and procedures for the LIPAc.

Education

- University degree

Recommended education and skills

- University degree in physics or engineering
- At least two years of accumulated professional experience in particle accelerator, or nuclear fusion environment, or similar.
- Working experience in a European or international setting.

Additional recommended skills

- Experience in EPICS, Linux and other relevant technologies, such as Siemens PLC, National Instruments cRIO, FPGA, VxWorks
- Ability to integrate into an international and multicultural environment;
- Strong communication skills
- Good organisational skills and ability to work under pressure.
- Good command of both written and spoken English.

2. Center: [KIT \(Karlsruhe, Germany\)](#)

2.a. 1 position on Neutronics for DONES

Task descriptions

- Conducting neutronics simulations in support of IFMIF-DONES design optimizations and radiation protections for target system, accelerator system, lithium system and other systems.
- Developing of neutronics simulation models from CAD data.
- Performing radiation transport, activation and shutdown dose rate simulations with appropriate level of verifications and quality assurance measures (technical checking, review, cross-comparisons, sensitivity studies, etc.)
- Evaluating nuclear performances and radiation protection capabilities and identifying further areas of work.
- Reporting and presenting all aspects of work, interacting with multi-disciplinary design teams and consulting on suitable design modifications.

Education

- University degree

Recommended education and skills

- University degree in physics or engineering (preference is for a Nuclear engineer).
- At least 2 years of relevant work experiences in the following areas:
 - Radiation transport simulations using MC codes, preferably MCNP.
 - Creating and modifying the MCNP geometry using CAD modeling tools and conversion tools.
 - Performing activation inventory calculations using FISPACT/ACAB.
 - Performing data analysis using scientific visualization codes, e.g. ParaView, VisIt, Origin.
- Fluid communication and documentation using English.
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Additional recommended skills

- Scientific computation using supercomputers.
- Programing using language Fortran, python or other programing languages.
- Knowledge in accelerator physics and fusion neutron physics.

3. Center: [ENEA \(Brasimone, Italy\)](#)

3.a. 1 position for DONES Remote Handling

Task description:

The maintenance activity of DONES components and systems is very a demanding task to be addressed to satisfy one of the main requirements of DONES plant availability that is of 70%. Due to the harsh environment maintenance will be performed by using remote handling (RH) techniques.

The development of the maintenance processes in the RH filed covers several aspects, among these there are:

- Development of a proper maintenance strategy to fulfil the requirement of plant availability;
- Development of the maintenance procedures, operations and their optimization.

- Design of RH equipment and tooling.
- Development of R&D program for the engineering and experimental validation tests of the RH operations on DONES systems and components.

In the near future, the validation of the main RH maintenance operations to be performed in the most critical area of the DONES, which is the Test Cell (TC), is planned. This area hosts the Target assembly (TA) and the High Flux Test Module (HFTM) that are the mostly exposed components to the neutron flux and then requiring regular preventive maintenance. Almost all these maintenance validation activities will be performed in the DRP facility at ENEA Brasimone (It).

The candidate will be required to prepare an R&D program for the engineering and experimental activities for the validation/qualification of the maintenance operations to be performed on the TC components. The activity will include the following topics:

- Definition of the R&D program with the objective of a fully test and qualification of the maintenance operations for the TC components, on the basis of international standards and rules.
- Planning of the experimental program, including evaluation/optimization of the resources needed.
- Studying the configuration of the DRP facility and, if required, propose the upgrading of the equipment/tooling and of the layout modification of the facility.
- Preparation and follow up of the execution of the experimental test campaigns
- Reporting and post data analyses.

The candidate will work in tight collaboration with an international team (DONES project) and with researchers from ENEA, Italian Universities and industries.

Education

- University degree

Recommended education and skills

- University degree in physics or engineering (preference is for a Mechanical, Nuclear or Mechatronic engineer).
- At least two years of proven professional experience, experimental work for a thesis included.

Additional recommended skills

- CAD Capability (CATIA or equivalent)
- Knowledge of programming language object oriented
- Ability to use MATLAB and toolboxes
- Ability to integrate into an international and multicultural environment.



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- Strong communication skills.
- Good organisational skills and ability to work under pressure.
- Good command of both written and spoken English.