

POST TITLE

Accelerator Physicist for the CERN Proton Synchrotron

Requesting Unit

BE-ABP-HSS

Associated Benchmark Job

Applied Physicist

Grade

6 or 7

Job description

Introduction

You will join:

The Accelerators and Beam Physics (ABP) group, part of the Beams department (BE), in charge of beam performance over the complete CERN accelerator chain, from the source to the Large Hadron Collider (LHC) and carries out Research & Development (R&D) activities on the upgrade of the LHC, its injectors, the Compact Linear Collider (CLIC), and Future Circular Colliders study (FCC).

The Hadron Synchrotron's Single Particle effects (HSS) Section is in charge of theoretical, numerical, and experimental studies of optics and linear and non-linear single-particle effects, affecting the performance of present and future hadron synchrotrons.

The design of new accelerators and the performance optimization of existing ones requires the development of accurate and predictive models of the beam dynamics, both linear and non-linear, together with powerful techniques and tools to measure and correct the optics. Indeed, the capability of measuring and correcting the actual optics of a ring is of paramount importance to make the ring behaving as the theoretical model, hence, performing according to expectations.

Functions

As Accelerator Physicist in the BE-ABP-HSS Section, you will participate in the activities related with single particle beam dynamics studies for the LHC injectors, with particular emphasis on the Proton Synchrotron Booster and Proton Synchrotron rings (see here <http://acc-models.web.cern.ch>) for the on-going upgrade studies. This includes activities on both numerical simulations and measurements, such as linear and non-linear optics determination and participation to the commissioning activities following the upgrades under implementation and to the subsequent performance improvement.

Furthermore, you will participate to the development of the simulation code SixTrack (see here <http://sixtrack.web.cern.ch/SixTrack/>)

You will:

- Develop and maintain an effective model that includes linear and non-linear beam dynamics effects.
- Conceive and develop optics measurement and correction techniques and the corresponding tools.

After a period of familiarisation you will:

- Conduct optics measurement, analyse the data collected, and implement the necessary corrections to obtain the expected optics characteristics
- Contribute to the studies to analyse and improve the performance of the current machine.
- Be part of the commissioning team restarting the injectors after the implementation of the changes related with the upgrade programme.
- Contribute to the development of SixTrack by extending existing capabilities or adding new ones as required by the studies and projects covered in the group.

- Contribute to the maintenance and users' support of SixTrack.

Qualifications

Master's degree or PhD in the field of physics or engineering (or equivalent).

Experience

The experience required for this position is:

- PhD in the field of physics or engineering (or equivalent) with a first relevant experience in a scientific environment preferably in the design and/or operation of particle accelerators or Master degree in the field of physics or engineering with extensive experience in a scientific environment, preferably in the design and/or operation of particle accelerators.
- Experience of accelerator physics, with demonstrated ability to compute beam optics.
- Experience of experimental techniques and analysis of data from beam measurements.
- Experience with single-particle beam dynamics simulation codes.

The following experience would be considered an asset:

- Experience with one of the following codes: MAD-X (see here <http://madx.web.cern.ch/madx/>), SixTrack.
- Experience of massive numerical simulations with modern simulations codes.
- Experience of experimental techniques and analysis of data from beam measurements

Technical competencies

- Knowledge and application of beam optics (rings and transfer lines)
- Knowledge and application of single-particle dynamics (longitudinal/transverse)
- Analysis and optimization of accelerator performance
- Simulation, design and development of particle accelerators

Behavioural competencies

- Communicating effectively and promoting mutual understanding: Expressing and explaining ideas in a clear, convincing manner;
- Demonstrating accountability: taking responsibility and being accountable for own actions;
- Working in teams: effectively collaborating within multi-disciplinary and international teams.
- Solving problems: assimilating large quantities of information, identifying key issues and formulating conclusions clearly and concisely
- Achieving results: Having a structured and organised approach towards work; being able to set priorities and plan tasks with results in mind.

Language skills

Spoken and written English or French: ability to understand and speak the other language in professional contexts. Ability to draw-up technical specifications and/or scientific reports and to make oral presentations in at least one of the two languages. The ability to understand and speak the other language in professional contexts would be an advantage

Additional information

Eligibility

Diversity has been an integral part of CERN's mission since its foundation and is an established value of the Organization. Employing a diverse workforce is central to our success. We welcome applications from all Member States and Associate Member States ([CERN: Member States](#)).

This vacancy will be filled as soon as possible, and applications should normally reach us no later than xx.xx.xx. By applying here, you allow CERN to consider your application for any position it considers relevant with respect to your profile. Please ensure you update your profile regularly with any relevant information and that you inform the Recruitment Service if you wish your file to be removed from the database.

Employment Conditions

We offer a limited-duration contract for a period of 5 years. Limited-duration contracts shall terminate by default on their date of expiry. Subject to certain conditions, holders of limited-duration contracts may be granted an indefinite contract.

SPECIAL CONDITIONS WHICH ARE REQUIRED IN A REGULAR BASIS	
	These functions require shift work, including nights, Sundays and official holidays.
	These functions require participation in a regular stand-by duty, including nights, Sundays and public holidays.
X	These functions require work during nights, Sundays and public holidays.
	These functions require work in radiation-controlled areas.
	These functions require interventions in underground installations.
	These functions require international travel
	A valid driving license is required.

SPECIAL CONDITIONS WHICH MAY BE REQUIRED DEPENDING ON THE NEEDS OF THE ORGANIZATION IN THE FUTURE	
	Shift work
	Stand-by duty
	Work during nights, Sundays and official holidays
X	Work in radiation-controlled areas
X	Interventions in underground installations
X	International travel