

## Call for contribution of expertise

CERN invites collaborating institutes and universities to contribute the expertise of their qualified employees to the activity described below.

*Start date:* 01/09/ 2018

*Duration:* One year, possible extension to a maximum of up to three years.

*Project/Activity:* Mechanical engineer

### *Detailed description of Activity:*

To extend its discovery potential, the LHC will undergo a major upgrade to increase its luminosity (rate of collisions) by a factor of 10 beyond its design value. One goal of the project is the installation of superconductive crab cavities to optimize the collision angle between the colliding beams. The HL-LHC WP4 is the work package dedicated to the design, production, testing and installation of the crab cavities, including the other components of the cryomodule such as helium tank, magnetic and thermal screens, vacuum tank, tuning system, power coupler and HOM lines, as well as instrumentation for the survey. You will join the WP4 engineering team within the EN-MME group, with the main task of designing and developing the RF tuner system. The working activities will include:

- Design and test the actuators for the HL-LHC crab tuner and similar RF tuners; this includes the mechanical design as well as the interface with the control design by BE/RF, in particular the maximum velocity of the RF tuning with ramped motors.
- Follow-up the performance of functioning tuners as well as the accelerated fatigue testing.
- Evaluate the influence of radiation on the performance.
- Develop and model Lorentz Force Detuning compensation with piezo actuators with possible tests on High Gradient cavities.
- Participate in the calculation and design of other RF cavity components

*Profile:* Master degree in mechanical engineering or equivalent. Technical experience with finite element codes and 3D CAD tools. Familiarity with precision manufacturing, assembly and construction methods, including preparation, planning, drawing and quality control. Some background in mechatronics. Attitude to teamwork in a multidisciplinary environment and to follow-up components from conception through to operation.

*Specific details:* A good proficiency in spoken and written English is required, with the ability to draw-up technical specifications and/or scientific reports and to make oral presentations. French is an asset, and the willingness to learn French is required. Work in controlled radiation areas, underground premises, on shift, and during nights/weekends when needed. Valid driving license. Good working knowledge of ANSYS would be an asset.

*Status at CERN:* Associated Member of the Personnel (Project Associate or COAS).

Conditions in accordance with CERN's Staff Rules and Regulations and Administrative Circular No. 11. Subsistence allowance is payable by CERN to cover the additional cost arising from the individual's (and, as applicable, their family's) stay in the local area while performing activities at CERN.

*Option:* Collaborating institutes and universities can propose to support the activity of the qualified employees participating in this "Call for contribution of expertise" with students or other employees. Their status and Subsistence allowance when applicable will be adapted to their relation with their institutions

*Contact person:* Isabel Bejar Alonso

*Reference:* 2018\_Q2\_006