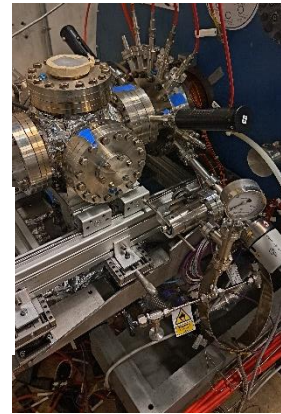
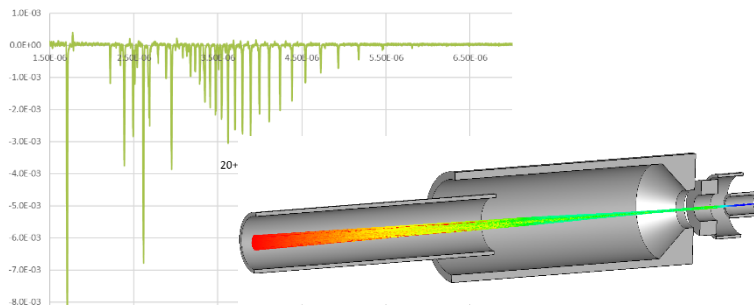


# Exploration of limitations for extended high-current Brillouin beams operated with high space-charge neutralization

*12-month technical studentship at CERN*



## Project description

The production of highly charged ions at low energy is of interest in several domains. At CERN, radioactive ions are for example brought into a high charge state in a charge breeding process before being injected into a linear post accelerator. There is also on-going R&D focussing on the production of high-intensity bunches of  $^{12}\text{C}^{6+}$  ions for use cancer therapy facilities. For these processes, an Electron Beam Ion Source (EBIS) is used. Presently, an EBIS featuring a high-current, high-density Brillouin beam is being recommissioned after major modifications.

## Tasks and student profile

The student would be involved in the re-commissioning of an EBIS, i.e. the launching and characterization of the electron beam and the production of highly charged ions. The work has an emphasis data harvesting and analysis, which go hand-in-hand with modelling of atomic physics and particle interaction processes, field simulations and particle tracking. This requires the candidate to have a general understanding of atomic physics processes, demonstrate a solid foundation in programming using Python, and preferably have previous experience from 3D particle tracking programs and/or FEM. As a part of the thesis involves commissioning of new beam equipment and practical operation of an EBIS, the student has to be self-reliant and feel comfortable in an experimental laboratory environment as these tasks are to a large extent hands-on. Knowledge about plasma physics is an advantage.

## Useful information

The project can lead to a master's thesis or be stand-alone. Pending the success of the project, the possibility of a PhD post may arise afterwards.

The scholarship is remunerated by the CERN organisation.

Link: <https://careers.smartrecruiters.com/CERN/tech>

Latest application date: 11<sup>th</sup> of March 2024

Starting date: Earliest 1<sup>st</sup> of July 2024

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