Project Discipline

Beam Physics

Project department

BE-ABP

Project code: BE-1

Project Title
Numerical modelling of long term evolution of colliding beams in the Large Hadron Collider

Project Description
In the LHC and HL-LHC colliders, the beam lifetime and the beam profile evolution are the results of the interplay of the several complex effects including beam-beam, noise and electron cloud. Recent code development in the field of tracking simulation, including the exploitation of GPUs, allows simulating those phenomena over timescales comparable with the LHC fill duration. The student will contribute to the further development and exploitation of these methods, aiming at a realistic modeling of the LHC beam evolution and a better understanding of the physical processes involved. The modeling should include bunch-by-bunch effects and dynamical variation of the machine configuration (e.g., “ADJUST” and “SQUEEZE” modes).

If you are interested in this project, please state this in your application form.