

Proposition de stages et mémoires

2020-2021

Le Service de Métrologie Nucléaire poursuit des activités dans les domaines de la proton thérapie et de la physique des accélérateurs avec plusieurs partenaires incluant l'Organisation Européenne pour la recherche nucléaire (CERN), Ion Beam Applications (IBA), le SCK-CEN et Royal Holloway (University of London). Les mémoires suivants sont proposés dans le cadre de ces collaborations aux étudiants de MA2 pour l'année académique 2020-2021.

Pour toute information complémentaire :

Cédric Hernalsteens (cedric.hernalsteens@ulb.be - +32 492 34 41 57)

Study of the synchrotron radiation effects in the interaction region of the CERN Large Hadron Electron Collider (LHeC)

Mémoire et possibilité de couplage avec un stage MA2

Contacts: Cédric Hernalsteens (cedric.hernalsteens@ulb.be) & Kévin André (k.andre@cern.ch)

Looking forward to the future upgrades of the Large Hadron Collider (LHC), a large international collaboration is investigating the possibility to have high-energy lepton-hadron collisions in the LHC tunnel. The LHeC project proposes the construction of a lepton accelerator (electrons or positrons at 50 to 60 GeV) to provide collisions with the 7 TeV protons of the LHC. The project aims at studying the interaction region, the straight section where the collisions take place, via numerical simulations using a ray-tracing magnetic transport code. The student will have access to a complete Python toolbox (in-house development by the Service de Métrologie Nucléaire) to perform the simulations. Comparisons with other simulations performed at CERN will validate the initial results. The model will be extended to include realistic misalignments of the magnetic components. The study, performed in collaboration with CERN, will focus in particular on the optimization of the synchrotron radiation in the interaction region.

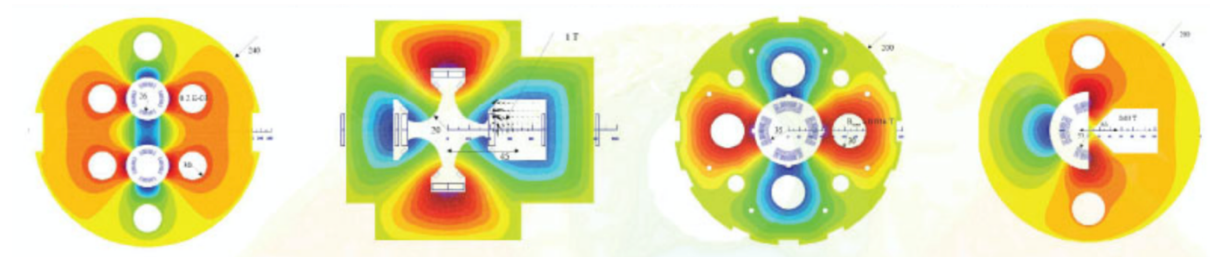


Figure 1 Magnet design to accommodate the proton and electron beams.