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Fermilab-University Joint PhD Program
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Attn: Support Letter for Bruce Rendon Yee

To Whom It May Concern:

Bruce Rendon Yee is a graduate student from CINVESTAV Polytechnic, Mexico. He anticipates pursuing his Ph.D. thesis research in a field of accelerator physics on the Large Hadron Collider (LHC) pending financial support.

As a summer student at CERN in 2010, he was assigned to work with F. Zimmerman and I to conduct single particle simulations for a future upgrade project of the LHC. In a very short span of time, Bruce was able to learn the particle simulation codes SIXTRACK and MADX, which we typically used in the field of particle accelerators for several tracking studies. Crab crossing is foreseen as a key upgrade feature for the LHC with several challenges confronting its feasibility.

Machine protection is identified as one of the most critical issues in the event of a cavity failure. Bruce was assigned to investigate machine protection related issues using particle tracking. He quickly managed to grasp the task at hand and started performing intensive particle simulations on the CERN computer cluster with existing software tools developed by the CERN collimation team. He independently benchmarked some key simulations from the past to get a better understanding of the existing tools. He also participated with other CERN colleagues to upgrade the existing tools, which will enable future dedicated machine protection studies.

He then performed some preliminary simulations to understand the upgrade features before his summer internship ended. Towards the end of his internship, he documented the simulation procedures and authored two comprehensive reports to outline his work during the summer.

I was impressed by Bruce's accomplishments in such a short period of time and his curiosity and hard work puts him clearly in the top 10%. It was a pleasure to work with him during the past summer. I am confident that he will pursue his Ph.D. in the field of accelerator physics with deep curiosity and vigor and investigate some of the key challenges confronting the LHC and its upgrade.

I strongly recommended Bruce for the joint Fermilab-University PhD program.

Thank you for your consideration and best regards,
Rama Calaga
Head of BNL-LARP Group & Associate Physicist, Accelerator R&D Division