Contribution ID: **1203** Type: **Oral (Student, In Competition) / Orale (Étudiant(e), inscrit à la compétition)**

Production of Silicon Strip Modules for the ATLAS Phase-II Upgrade of the Inner Detector

Wednesday 15 June 2016 09:00 (15 minutes)

The Phase-II upgrade of the Large Hadron Collider (HL-LHC) will increase the luminosity of the machine by a factor of 10, providing an additional integrated luminosity of 3000 fb-1 over the course of 10 years. The present ATLAS inner detector must therefore be completely replaced in order to cope with the high pileup and radiation environment of the HL-LHC. The new all-silicon tracker (ITk) will be composed of pixel and strip layers, an extensive undertaking which will involve the coordinated effort of many groups around the world. After the development of a dedicated lab and clean room, the University of Toronto, in partnership with industry, successfully fabricated and tested the first ITk silicon strip modules produced entirely in Canada. The readout boards ("hybrids") of individual strip modules are wire-bonded to the silicon, and as such the success and reliability of these bonds are crucial for the functioning and longevity of the detector. Optimization of the wire-bonding process is therefore very important, in addition to ensuring even and precise glue heights between the hybrids, silicon, and other surface-mounted components. As the next phase of prototype fabrication begins, studies of wire-bonding optimization and metrology are performed. In addition, we are investigating the possibility of industrializing the production process of the hybrids in anticipation of mass-production. Finally, we are implementing a beta test set-up for the characterization and testing of electrical modules.

Author: VELOCE, Laurelle Maria (University of Toronto (CA))

Co-authors: KEOSHKERIAN, Houry (University of Manchester (GB)); ZUTT, Nicholas (University of Toronto); DI SIPIO, Riccardo (University of Toronto (CA)); TEUSCHER, Richard (Toronto); ORR, Robert (University of Toronto (CA)); ABIDI, Syed Haider (University of Toronto (CA))

Presenter: VELOCE, Laurelle Maria (University of Toronto (CA))

Session Classification: W1-2 Energy Frontier: Standard Model and Higgs Boson (PPD) / Frontière d'énergie: modèle standard et boson de Higgs (PPD)

Track Classification: Particle Physics / Physique des particules (PPD)