Contribution ID: **990** Type: **Oral (Student, Not in Competition) / Orale (Étudiant(e), pas dans la compétition)**

Search for supersymmetric partners of gluons and third generation quarks in events with b-jets and large missing transverse momentum in 13 TeV proton-proton collisions at the LHC using the ATLAS detector.

Wednesday 15 June 2016 09:45 (15 minutes)

Supersymmetry, a generalisation of the space-time symmetries which associates a new boson to each Standard Model fermion and vice-versa, must be obervable near the weak scale in order to solve the hierarchy problem. If the lepton and baryon numbers are conserved, the lightest supersymmetric particle is stable and interacts only weakly providing a viable dark matter candidate. Searches for supersymmetry at the LHC are thus highly motivated. A search for strong production of pairs of gluinos, the supersymmetric partner of the gluon, decaying via sbottom and stop quarks, the supersymmetric partners of the bottom and top quarks, is reported. A 3.3 fb-1 13 TeV proton-proton LHC dataset, recorded by the ATLAS detector, is used. This sample is probed for events containing several high transverse momentum jets, of which at least 3 must be identified as originating from b-quarks, large missing transverse momentum, and potentially isolated charged leptons. Massive large-radius jets, indicating the presence of highly boosted top quarks, are also used. No significant deviation from the Standard Model prediction is observed and limits are set in the gluino-neutralino mass plane in the framework of simplified models of gluinos decaying via sbottom and stop quarks. Large increase in cross-sections for gluino pair-production with respect to the 8 TeV LHC and the recent installation of the Insertable B-Layer at the center of the ATLAS detector, which appreciably improves the b-jet identification performance, allows the previous limits to be significantly increased using the relatively small 2015 LHC dataset. For neutralino masses below approximately 700 GeV, gluino masses of less than approximately 1.8 TeV are excluded at the 95% CL in both models, constituting the current world-wide best limits in these frameworks and some of the biggest improvements with respect to LHC run 1 searches so far.

Author: GAGNON, Louis-Guillaume (Universite de Montreal (CA))

Presenter: GAGNON, Louis-Guillaume (Universite de Montreal (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)