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Search for production of supersymmetric particles in final states with missing transverse momentum and multiple b-jets in 2015-2016 LHC p-p collision data with the ATLAS detector (student talk)

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Supersymmetry (SUSY), an hypothetical theory which associate new fundamental particles to each Standard Model (SM) particle, is one of the most well-motivated SM extensions and could solve some of its biggest outstanding problems. For example, if the lepton and baryon numbers are conserved, the lightest supersymmetric particle is stable and interacts only weakly providing a viable dark matter candidate. Moerover, if the supersymmetric partners of gluons and third generation quarks have masses near the weak scale, the hierarchy problem could also be solved. A search for supersymmetry involving the pair production of gluinos decaying via third-generation squarks to the lightest neutralino, a dark matter candidate, is reported. It uses LHC proton–proton collision data at a centre-of-mass energy of 13 TeV with an integrated luminosity of 36.1 fb^{-1} collected with the ATLAS detector in 2015 and 2016. The search is performed in events containing large missing transverse momentum and several energetic jets, at least three of which must be identified as originating from b-quarks. No excess is found above the predicted SM background. For neutralino masses below approximately 300 GeV, gluino masses of less than 1.97 (1.92) TeV are excluded at 95\% CL in simplified models involving the pair production of gluinos that decay via top (bottom) squark. An interpretation of the limits in terms of the branching ratios of the gluinos into third generation squarks is also provided. These results significantly extend the exclusion limits obtained with the 3.2 fb^{-1} of data collected in 2015.

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