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Search for non-minimally flavour-violating supersymmetry in tc+ETmiss final states with the ATLAS experiment

Supersymmetry remains one of the most popular Beyond Standard Model theories proposing solutions to the limitations of the Standard Model, e.g. the naturalness problem and the lack of a viable dark matter candidate. However, the lack of signs for supersymmetric particles at the LHC imposes strong constraints on the simplest versions of supersymmetry. One natural solution is to abandon the idea of a minimal realization of supersymmetry. Non-minimal flavour-violating versions of the MSSM propose a mixture of the 2nd and 3rd squark generation, motivating searches in signatures containing a top-quark plus a charm-quark at the LHC. This poster presents a search for the production of a pair of top-squarks decaying into an all-hadronic top-quark, a c-quark and two neutralinos. The neutralinos are expected to be stable and leave a signature of large missing transverse momentum in the ATLAS detector. Top-tagging and c-tagging techniques are used in this analysis in order to increase the sensitivity to tc+ETmiss supersymmetric signals in boosted and resolved topologies. Finally, the information of all the jets and the missing transverse momentum is combined in a neural network to probe compressed topologies in this signature.

Collaboration / Activity

ATLAS

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