



Contribution ID: 634

Type: poster

Search for FCNC single top-quark production at 8 TeV with the ATLAS detector

A search for anomalous single top-quark production via strong flavour changing neutral currents has been performed. Data collected by the ATLAS experiment in 2012 at a centre-of-mass energy $\sqrt{s} = 8$ TeV, and corresponding to an integrated luminosity of 20.3 fb^{-1} are used. Events in which a light quark (u or c) interacts with a gluon to produce a single top quark are sought. To discriminate between signal and background processes a multivariate technique using a neural network is applied. The final statistical analysis was performed using a frequentist technique. As no signal is seen in the observed output distribution, an upper limit on the production cross-section is set. The observed 95% CL limit on the production cross-section multiplied by the $t \rightarrow bW$ branching fraction $\sigma_{qg \rightarrow t} \times B(t \rightarrow bW)$ is measured. From this, the upper limit on the coupling constants κ_{ugt}/Λ and κ_{cgt}/Λ and on the branching fractions $B(t \rightarrow ug)$ and $B(t \rightarrow cg)$ are derived.

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Track Classification: Top and Electroweak Physics