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Single Top quark production cross section using the ATLAS detector at the LHC

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Measurements of single top-quark production cross section in proton proton collisions at 7 and 8 TeV are presented.

In the leading order process, a W boson is exchanged in the t-channel. The single top-quark and anti-top total production

cross sections, their ratio, as well as a measurement of the inclusive production cross section is presented.

Differential cross sections for the top and anti-top processes are measured as a function of the transverse momentum

and the absolute value of the rapidity of top and anti-top, respectively. In addition, a measurement of the production cross section of a single top quark in association with a W boson is presented. All measurements are

compared to NLO and NLO+NNLO calculations and the CKM matrix element $|V_{tb}|$ is determined. In addition, the

s-channel production is explored and limits on exotic production in single top quark processes are discussed.

This includes the search for flavor changing neutral currents and the search for additional W bosons in the s-channel.

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