

## Measurement of the top quark cross-section in the single-lepton channel in pp collisions at $\sqrt{s} = 7$ TeV using kinematic fits and b-tagging information

The measurement of the top-quark pair production cross-section is a powerful tool to test the Standard Model (SM) at a new energy. With the recent advances in theoretical calculations that led to predictions at a precision level of 10%, this

measurement particularly provides a precision test of the theory of Quantum Chromodynamics.

At the same time, the decays of top-quark pairs are phenomenologically similar to processes predicted by beyond-SM

theories, thus representing an irreducible background that has to be studied thoroughly.

In this first phase of data taking of the ATLAS detector, a copious process like  $t\bar{t}$  production can be also exploited to test the performance of the detector itself. The single-lepton channel, in which the W boson produced in the decay of one top quark decays leptonically and the W boson from the other top quark decays hadronically, currently provides the best trade-off between experimental accessibility, production rate and background contamination.

The measurement of the  $t\bar{t}$  production cross-section in the single-lepton channel in pp collisions at a centre-of-mass energy  $\sqrt{s} = 7$  TeV is presented.

The analysis is based on a multivariate discriminant distribution in 3, 4 and  $\geq 5$  jet bins using three kinematic variables and b-tagging information.

With a data sample of about  $35 \text{ pb}^{-1}$  recorded by ATLAS in 2010 the inclusive top quark production cross-section is measured to be  $\sigma_{t\bar{t}} = 186 \pm 10 \text{ (stat.)}_{-20}^{+21} \text{ (syst.)} \pm 6 \text{ (lumi.) pb}$ . This measurement is in agreement with the theory prediction.

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