

Top mass measurement in the semileptonic channel with the ATLAS detector

The top quark has been discovered in 1995 at Fermilab. Being the heaviest known elementary particle, it plays a special role in the Standard Model. The LHC produced first pp collisions at 7 TeV centre-of-mass energies in fall 2009. The top quark was observed in both experiments ATLAS and CMS during 2010.

First top mass measurement by ATLAS have been made using 35 pb⁻¹ of data recorded in 2010. Three separate direct measurements were performed in the semileptonic decay channel.

All three compare data to templates from simulation at different mass points. The default method uses a stabilized top mass and the R32 variable which is the ratio between reconstructed top mass and reconstructed W mass.

The top mass measurement obtained for 2010 data is $m_{\text{top}} = (169.3 + 4.0 + 4.9) \text{ GeV}/c^2$. The most important systematic

uncertainty came from Jet Energy Scale the top mass being the invariant mass of three reconstructed jets.

The luminosisty increase will allow to record more that 1 fb⁻¹ by the end of the year 2011.

By July, close to 500 pb⁻¹ of data will be used to obtain a more precise measurement of the top mass.

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