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Measurement of the W boson helicity fractions in ttbar events at 8 TeV in the lepton+jets channel with the ATLAS detector

Precise measurements of the properties of the top quark allow for testing the Standard Model (SM) and can be used to constrain new physics models. The top quark is predicted in the SM to decay almost exclusively to a W boson and b quark. Thus, studying the Wtb vertex structure in high precision and details is motivated. A measurement of the W boson helicity fractions in top quark decays with ttbar events in the lepton+jets final state using protonproton collisions at a centerofmass energy of 8 TeV recorded in 2012 with the ATLAS detector at the LHC is presented. The data sample corresponds to an integrated luminosity of 20.3 fb1. The angular distributions of two different analysers, the charged lepton and the downtype quark are used to measure the helicity fractions. The results are obtained by performing a combined fit of both analysers to data. The measured helicity fractions are compatible with the Standard Model. As the polarization state of the W bosons in top quark decays is sensitive to the Wtb vertex structure, limits on anomalous Wtb couplings are set.

Summary

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