



Contribution ID: 5

Type: **not specified**

Measurement of top quark polarisation in t-channel single top quark production

A first measurement of the top quark spin asymmetry, sensitive to the top quark polarisation, in t-channel single top quark production is presented. It is based on a sample of pp collisions at a centre-of-mass energy of 8 TeV corresponding to an integrated luminosity of $19.7 fb^{-1}$. A high-purity sample of t-channel single top quark events with an isolated muon is selected. Signal and background components are estimated using a fit to data. A differential cross section measurement, corrected for detector effects, of an angular observable sensitive to the top quark polarisation is performed. The differential distribution is used to extract a top quark spin asymmetry of $0.26 \pm 0.03(stat) \pm 0.10(syst)$, which is compatible with a p-value of 4.6% with the standard model prediction of 0.44.

Summary

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Session Classification: Poster Session & Finger-Food Dinner

Track Classification: Poster Session