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Measurement of the complete top-quark polarization vector in t-channel single-top-quark production with ATLAS detector

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A simultaneous measurement of the three components of the top-quark and top-antiquark polarization vectors in t-channel single-top-quark production is presented. Due to the large mass of the top quark, the $t \to Wb$ decay occurs before hadronization, giving one access to its polarization through the angular distribution of the decay products. The analysis we present uses an integrated luminosity of 139 fb^{-1} of proton-proton collisions at 13 TeV, collected with the ATLAS detector at the LHC. We also discuss the more intricate analysis of the quadruple-differential decay rate of t-channel single-top-quark, which is currently in progress; its purpose is the simultaneous determination of four decay amplitudes and their phases in addition to all three components of the polarization vector for top quarks and antiquarks separately. Prospects for constraining anomalous couplings/Effective-Field-Theory coefficients with this analysis are also discussed.

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Yes

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