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Measurement of tau polarization in $Z \rightarrow \tau\tau$ decays with the ATLAS detector

Decays of the Z boson in the Standard Model violate parity, leading to a net polarization of the decay products. Z boson decays to pairs of tau leptons provide a unique opportunity to measure the tau polarization by using the kinematics of the subsequent tau decays, hence testing the Standard Model predictions. They also provide a unique opportunity to pioneer experimental techniques that assess the tau helicity and may be used in searches for new particles and to study the Higgs boson.

A measurement of the tau polarization in $Z \rightarrow \tau\tau$ decays is presented. The analysis is based on the 20.3/fb of proton proton collision data collected at a center of mass energy of 8 TeV by the ATLAS experiment at the CERN Large Hadron Collider in 2012. The tau polarization is measured in events in which one tau decays leptonically and the other decays hadronically by using the kinematics of the hadronic decay.

Experimental Collaboration

ATLAS

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