



Contribution ID: 458

Type: **Poster Presentation**

Test of CP violation in b-hadron decays using $t\bar{t}$ events in 8 TeV ATLAS data and 13 TeV perspectives

CP violation in weak interactions is well-established in Particle Physics. Nevertheless, the most recent combination of all CP violation measurements is found to be insufficient to explain the size of the matter-antimatter asymmetry present in the Universe. The large number of top-antitop pair events produced in pp collisions at the Large Hadron Collider (LHC) provides a unique source of b-quarks that can be used to probe CP violation in heavy-flavour mixing and decay. This measurement focuses on semileptonic top-antitop events where one of the W-bosons decays hadronically and the other one decays leptonically. The charge of the lepton (electron or muon) from the W-boson tags the charge of the b-quark at production. In events where a muon is associated to the semileptonic decay of the b-quark (either directly or after a $b \rightarrow c$ hadronic transition), two charge asymmetries (CA) and several CP asymmetries, based on the charges of the lepton from the W-boson and this muon, can be measured. The first measurement of the CA and CP asymmetries in heavy flavour b- or c-decays from top-antitop lepton+jets events is presented using the data collected with the ATLAS detector during Run 1 of the LHC. An overview of the future perspectives and improvements of this measurement in Run 2 is also provided.

Experimental Collaboration

ATLAS

Presenter: D'ONOFRIO, Adelina (University of London (GB))**Session Classification:** Poster session**Track Classification:** Top and Electroweak Physics