

Measurement of the $t\bar{t}$ charge asymmetry in the dilepton channel in the D0 and ATLAS collaboration

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The top quark, first observed by the CDF and D0 Collaborations in 1995 [1, 2], is the heaviest of all elementary particles. Due to the large top-quark mass, the measurement of the production and decay properties of top quark pairs in proton-antiproton collisions provides an important test of the standard model of particle physics (SM) that may unveil the presence of new phenomena beyond the SM (BSM).

Perturbative quantum chromodynamics (pQCD) at next-to-leading order (NLO) predicts that top quark-antiquark production in quark-antiquark annihilation in the center of mass frame is forward-backward (FB) asymmetric in the angular distributions of the top and antitop quarks.

In 2011 results from CDF and D0 [3,4] have driven a lot of attention because some of the measured asymmetries were significantly higher than the predictions based on the SM. Processes beyond the SM can modify the top-antitop production asymmetry and thus predict a higher asymmetry.

I'm going to present the asymmetry measurements I'm involved at the D0 and ATLAS experiments.

[1] F. Abe et al. (CDF Collaboration), Phys. Rev. Lett. 74, 2626 (1995).

[2] S. Abachi et al. (D0 Collaboration), Phys. Rev. Lett. 74, 2632 (1995).

[3] T. Aaltonen et al. (CDF Collaboration), Phys. Rev. D 83, 112003 (2011).

[4] V. M. Abazov et al. (D0 Collaboration), Phys. Rev. D 84, 112005 (2011).

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