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Top quark forward-backward asymmetry from gauged flavor symmetry

Friday 6 July 2012 10:00 (17 minutes)

The CDF and D0 experiments have reported measurements of the top quark forward-backward asymmetry A_{FB} which are (2.5-3.5) sigma away from the standard model predictions. In this talk it will be shown that this anomaly can be explained by new physics that arises when the flavor symmetry of the standard model is gauged in a maximal way. The flavor gauge symmetry would provide an understanding of the three family structure and the pattern of fermion masses. The Higgs doublets needed for generating the fermion masses contribute to A_{FB} in the right amount, while being consistent with all flavor changing constraints. The recent measurements of the top quark charge asymmetry A_C at the LHC by CMS and ATLAS provide additional constraints on these models. Interestingly, these constraints are compatible with models with extra Higgs doublets. Sharper predictions for A_C will be given, and the possibility of explaining an excess in the dijet invariant mass in the Wjj channel observed by CDF will be noted. New Higgs scalars in the mass range (150-400) GeV are predicted.

Summary

The anomaly in A_{FB} observed by the CDF and D0 experiments can be explained via new Higgs scalar exchange arising from flavor gauge symmetries. Sharp predictions for the charge asymmetry A_C at the LHC will be given. New scalars in the mass range (150-400) GeV are predicted by these models.

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