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Study of CP-violating charge asymmetries of like-sign dimuons and first measurement of the forward-backward asymmetry in the production of B+ mesons in pp(bar) collisions

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We present a measurement of the inclusive single muon charge asymmetry and the like-sign dimuon charge asymmetry in pp(bar) collisions using the full data set of 10.4 fb-1 collected with the D0 detector at the Fermilab Tevatron. The measurements differ from the standard modelpredictions of CP violation in these asymmetries with a significance of 3.6 standard deviations. These results are interpreted in a framework of B meson mixing to measure the relative width difference Delta(Gamma_d)\Gamma_d between the mass eigenstates of the B0 meson system, and the semileptonic charge asymmetries tge of B^0 and B0_s mesons.

We also present the first measurement of the forward-backward asymmetry in b-quark production at a hadron collider using
the same dataset. The b-quarks are detected in the fully reconstructed decay B+ -> J/psi K+. The frequent reversal of the magnetic fields in the D0 detector allows for the cancellation of many detector effects. Remaining detector asymmetries are corrected using data-driven methods, and the final results are checked using separate B^+ and B^-$ samples.

Summary

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