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Measurements of the W charge asymmetry, the weak mixing angle and Z ϕ^* in pp(\bar{p}) collisions with the D0 detector

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Result of merged abstracts:

We present charge asymmetry measurements from W boson decays in both electron and muon channels, with 7.3 fb $^{-1}$ to 9.7 fb $^{-1}$ of Run II data collected by the D0 detector at the Fermilab Tevatron Collider. In the electron channel, we present the lepton asymmetry as a function of the electron transverse momentum and pseudo-rapidity out to $|\eta| \leq 3.2$; we also give the W charge asymmetry as a function of W boson rapidity. These asymmetries are compared with next-to-leading order perturbative quantum chromodynamics calculations. In the muon channel, we present the lepton asymmetry for three kinematic ($p_T(\mu)$, MET) bins. These charge asymmetry measurements will allow more accurate determinations of the proton parton distribution functions.

Using all RunII data collected by the D0 detector at the Fermilab Tevatron Collider, we present measurements of the forward-backward charge asymmetry distribution of e^+e^- as a function of dielectron invariant mass around the Z pole and an extraction of the effective weak mixing angle. The measured value of the weak mixing angle is the most precise from light quark interactions, and comparable to the best LEP and SLD results. We also present measurements of the Z/γ variable ϕ . *The measurement of ϕ probes the same physical effects as the Z/γ boson transverse momentum, but is less susceptible to the effects of experimental resolution and efficiency. The ϕ distribution is measured in three invariant mass regions, and compared with higher-order predictions.*

Summary

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