



Measurement of top quark properties - electric charge and width (D0)

Thursday, July 5, 2012 4:15 PM (15 minutes)

We present a measurement of the electric charge of the top quark and an improved determination of the total width of the top quark, Γ_t , using 5.3 fb⁻¹ of integrated luminosity collected by the D0 Collaboration at the Tevatron ppbar Collider. The top quark charge is reconstructed from the top quark decay products in events which have an isolated high-pT charged lepton, large missing transverse momentum, and at least four high-pT jets, at least two of which identified as b-quark jets by a neural network. We exclude the hypothesis that the top quark is an exotic quark of charge $-4e/3$ at a confidence level greater than six standard deviations and conclude that the observed top quark charge is in good agreement with the standard model value of $2e/3$. The total width Γ_t is extracted from the partial decay width $\Gamma(t \rightarrow Wb)$, obtained from the t-channel single top quark production cross section, and the branching fraction $B(t \rightarrow Wb)$ measured in ttbar events. For a top mass of 172.5 GeV, the resulting width is $\Gamma_t = 2.00^{+0.47}_{-0.43}$ GeV which translates to a top-quark lifetime of $\tau_t = (3.29^{+0.90}_{-0.63}) \cdot 10^{-25}$ s.

Primary author: Prof. SCHWANENBERGER, Christian (University of Manchester (UK))

Presenter: Prof. SCHWANENBERGER, Christian (University of Manchester (UK))

Session Classification: TR4 - Top Quark Physics

Track Classification: Track 4 - Top Quark Physics