Contribution ID: **33** Type: **not specified**

Measurement of t-channel Single Top quark production cross-section at D0

Tuesday, 31 May 2011 09:00 (20 minutes)

We present a model-independent measurement of t-channel electroweak production of single top quarks in ppbar collisions at center of mass energy of 1.96 TeV. Using 5.4 fb^−1 of integrated luminosity collected by the D0 detector at the Fermilab Tevatron Collider, and selecting events containing an isolated electron or muon, missing transverse energy and one or two jets originating from the fragmentation of b quarks, we measure a cross section σ($p\bar{p} \longrightarrow tqb + X$) = 2.90 ą 0.59 (stat + syst) pb for a top quark mass of 172.5 GeV. The probability of the background to fluctuate and produce a signal as large as the one observed is 1.6 × 10^−8, corresponding to a significance of 5.5 standard deviations.

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Session Classification: Session 1

Track Classification: Energy Frontier