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Measurement of the Wtb Coupling and the W Boson Helicity in Top Quark Decays with the D0 Detector

We present the simultaneous measurement of the ratio of branching fractions, R=B(t -> Wb)/B(t -> Wq), with q being a d, s, or b quark, and the top quark pair production cross section sigma(ttbar) in the lepton plus jets channel using data at sqrt(s)=1.96 TeV collected with the D0 detector. We extract R and sigma(ttbar) by analyzing samples of events with 0, 1 and >2 identified b jets.

We also report on a model-independent measurement of the helicity of W bosons produced in top quark decays based on a 4 fb-1 sample of ttbar events in the dilepton and lepton+jets channels.
W boson helicity fractions are sensitive to the ratios of different anomalous Wtb couplings as well as single top production.
We set simultaneous limits on left-handed vector and right-handed vector, and left-handed vector and right-handed tensor Wtb couplings measured using the single top selection.
We combined this analysis with the W boson helicity measurement to set direct upper limits on a right-handed vector coupling as well as a left-handed tensor coupling.

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