- Title: Measurement of the Top Quark Pair Production Cross Section in Lepton+Jets Final States at DØ

  Abstract: Measurement of the top quark pair ($t\bar{t}$) production cross section at hadron colliders can be used to test perturbative QCD predictions. Within the Standard Model, the top quark almost always decays to a W boson and a b quark. We present a measurement of the $t\bar{t}$ production cross section at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions using about 220 pb^{-1} of data collected by the DØ experiment during Run II of the Fermilab Tevatron collider. We consider the lepton+jets final state, which is characterized by four or more jets, a high transverse momentum isolated electron or muon and high missing transverse energy, resulting from the decay of one W boson into a charged lepton and a neutrino and the other W boson into a quark-antiquark pair. The analysis is further subdivided into one based purely on a topological event selection, and another requiring the reconstruction of a soft muon within a jet, a sign of a semileptonic B hadron decay.

- Title: Measurement of the Top Quark Pair Production Cross Section in Dilepton+Jets Final States at DØ

  Abstract: Measurement of the top quark pair ($t\bar{t}$) production cross section at hadron colliders can be used to test perturbative QCD predictions. Within the Standard Model, the top quark almost always decays to a W boson and a b quark. We present a measurement of the $t\bar{t}$ production cross section at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions using about 220 pb^{-1} of data collected by the DØ experiment during Run II of the Fermilab Tevatron collider. We consider the dilepton+jets final state, which is characterized by two or more jets, two high transverse momentum isolated charged leptons, either two electrons, one electron and one muon, or two muons, and high missing transverse energy, resulting from the leptonic decay of both W bosons in the event.

- Title: Measurement of the Top Quark Pair Production Cross Section in Lepton+Jets Final States at DØ using Lifetime b Tagging

  Abstract: Measurement of the top quark pair ($t\bar{t}$) production cross section at hadron colliders can be used to test perturbative QCD predictions. We present measurements of the $t\bar{t}$ production cross section at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions using about 165 pb^{-1} of data collected by the DØ experiment during Run II of the Fermilab Tevatron collider. Within the Standard Model (SM), the top quark almost always decays to a W boson and a b quark, thus leading to the presence of two b jets in the event. By using its new silicon tracker, the DØ experiment is capable of identifying b jets based on lifetime tagging. The analyses presented here use the expected b jet content of $t\bar{t}$ events to discriminate between the top signal and the SM backgrounds. We report on the application of this technique to the lepton+jets final state.

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the event. By using its new silicon tracker, the DØ experiment is capable of identifying b jets based on lifetime tagging. The analyses presented here use the expected b jet content of $t\bar{t}$ events to discriminate between the top signal and the SM backgrounds. We report on the application of this technique to the dilepton+jets final state.

- Title: Measurement of the Top Quark Pair Production Cross Section in the All-Jets Final State at DØ using Lifetime b Tagging

  Abstract: Measurement of the top quark pair ($t\bar{t}$) production cross section at hadron colliders can be used to test perturbative QCD predictions. We present measurements of the $t\bar{t}$ production cross section at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions using about 165 pb^{-1} of data collected by the DØ experiment during Run II of the Fermilab Tevatron collider. Within the Standard Model (SM), the top quark almost always decays to a W boson and a b quark, thus leading to the presence of two b jets in the event. By using its new silicon tracker, the DØ experiment is capable of identifying b jets based on lifetime tagging. We report on the application of this technique to the all-jets channel, characterized by at least six jets in the final state. Further discrimination between the top signal and the large multijets background is achieved by making use of Neural Network techniques.

- Title: Studies of Top Pair Production in the Tau+Muon+Jets Channel at DØ

  Abstract: We present preliminary studies of the tau+muon+jets channel with emphasis on the top quark pair production cross-section measurement using about 220 pb^{-1} of proton-antiproton collisions at $\sqrt{s} = 1.96$ TeV. Tau identification in the hadronic final state is studied using $Z \to \tau^+\tau^-$ events. Sensitivity to lepton universality and charged Higgs production (in the scenario $M_{H^+} < m_t$) is discussed.

- Title: Search for Single Top Quark Production at DØ

  Abstract: We present a search for the electroweak production of single top quarks at the DØ experiment of the Fermilab Tevatron proton-antiproton collider at $\sqrt{s} = 1.96$ TeV using Run II data. The search is performed in the electron+jets and muon+jets decay channels. We improve the signal to background ratio by applying three algorithms to indicate the presence of a jet originating from a b quark. Single top quarks are often produced together with a high transverse momentum central b quark, and the top quark decay also includes a b quark, whereas most background sources do not contain such b quarks. The b identification algorithms are reconstructing a muon in a jet from a semileptonic B hadron decay, and two methods that rely on the long lifetime of the B hadrons: a secondary-vertex tagger and a jet-lifetime-probability tagger. We set upper limits on the cross sections for the two production modes, s- and t-channel, separately and combined.

- Title: Measurement of the Top Quark Mass in the Lepton+Jets Channel at DØ using a Template-Based Method

  Abstract: Within the Standard Model, the precise measurement of the top quark mass, together with an improved measurement of the W boson mass, serves as an important tool in constraining the mass of the yet to be observed Higgs Boson. We present a measurement of the top quark mass using data collected at the DØ experiment at Fermilab. The Fermilab Tevatron collides protons and antiprotons at a center of mass energy of 1.96 TeV. This measurement utilizes approximately 165 pb^{-1} of data. In

this talk we will limit ourselves to the measurement of the top quark mass using the lepton+jets final state topology of the top quark pair decay. This analysis makes use of kinematic fitting of the final state objects to reconstruct the top quark mass.

- Title: Measurement of the Top Quark Mass in the Lepton+Jets Channel at DØ using a Matrix Element-Based Method

  Abstract: The top quark mass is one of the fundamental parameters of the Standard Model (SM). Since its mass is the largest of all known fermions, precise knowledge of it may provide insight into physics beyond the SM. At a hadron collider, top quarks are dominantly produced in pairs ($t\bar{t}$), each of them decaying to a W boson and a b quark. We report on the measurement of the mass of the top quark in the lepton+jets channel, using data collected by the DØ experiment at the Fermilab Tevatron collider at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions. The top quark mass is extracted by making use of an event-by-event likelihood built from the matrix elements for signal and background, thus making an extensive use of the available statistical information. This method was first applied to the Run I dataset to measure the top quark mass at DØ, generating considerable excitement by reducing the statistical uncertainty by about a factor of two with respect to previous methods.

- Title: Measurement of the Top Quark Mass in the Dilepton+Jets Channel at DØ

  Abstract: The top quark mass is a key parameter of the Standard Model. We fit events exhibiting the final state consisting of two leptons, two neutrinos, and two b quark jets, resulting from the production and decay of a $t\bar{t}$ pair. Measurement of the top mass in dilepton+jets events is less affected by uncertainties in jet energy calibration which dominates the analysis in the lepton+jets channels. Using data collected with the DØ detector at the Tevatron collider in Run II, a preliminary measurement of the top quark mass will be presented. The event selection and method of determining the top mass from this final state, taking into account backgrounds, will be described.

- Title: Measurement of the W Boson Helicity in Top Quark Decays at DØ using a Topological Analysis

  Abstract: Within the Standard Model, the helicity of the W boson in the top quark decay is given by the V–A coupling. As the top quark is by far the heaviest of all fermions, some models predict an additional V+A coupling between the top quark and the W boson. At a hadron collider, top quarks are dominantly produced in pairs ($t\bar{t}$), each of them decaying to a W boson and a b quark. We report on a measurement of the W helicity in top quark decays using about 165 pb^{-1} of data collected by the DØ experiment at the Fermilab Tevatron collider at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions. Events are selected in the lepton+jets channel, with one W boson decaying into a charged lepton (electron or muon) and a neutrino and the other W boson into a quark antiquark pair. Top quark pair candidate events are selected using topological information. The fraction of top quark decays to right-handed W bosons is determined from the angular distribution of the charged lepton with respect to the W boson direction in the W boson rest frame.

- Title: Measurement of the W Boson Helicity in Top Quark Decays at DØ using Lifetime b Tagging

  Abstract: Within the Standard Model, the helicity of the W boson in the top quark decay is given by the V–A coupling. As the top quark is by far the heaviest of all

fermions, some models predict an additional V+A coupling between the top quark and the W boson. At a hadron collider, top quarks are dominantly produced in pairs ($t\bar{t}$), each of them decaying to a W boson and a b quark. We report on a measurement of the W helicity in top quark decays using about 165 pb^{-1} of data collected by the DØ experiment at the Fermilab Tevatron collider at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions. Events are selected in the lepton+jets channel, with one W boson decaying into a charged lepton (electron or muon) and a neutrino and the other W boson into a quark antiquark pair. This analysis makes use of events with at least one tagged b jet. The fraction of top quark decays to right-handed W bosons is determined from the angular distribution of the charged lepton with respect to the W boson direction in the W boson rest frame.

- Title: Measurement of B($t \to Wb$)/B($t \to Wq$) at DØ

  Abstract: At a hadron collider, top quarks are dominantly produced in pairs ($t\bar{t}$). Within the Standard Model (SM), assuming three generations of fermions and unitarity of the CKM matrix, the top quark decays to a W boson and a b quark almost 100% of the times. A deviation from this prediction will indicate the presence of new physics beyond the SM. We report on the direct measurement of the ratio B($t \to Wb$)/B($t \to Wq$), with q being any quark, using about 165 pb^{-1} of data collected by the DØ experiment at the Fermilab Tevatron collider at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions. Events in the lepton+jets channel, with one W boson decaying into a charged lepton (electron or muon) and a neutrino and the other W boson into a quark-antiquark pair, are selected. Identification of b quarks is done using a lifetime tagging algorithm.

- Title: Measurement of the Cross Section Ratio $\sigma(t\bar{t} \to \ell\ell' + jets)/\sigma(t\bar{t} \to \ell + jets)$

  Abstract: At a hadron collider, top quarks are dominantly produced in pairs ($t\bar{t}$). Within the Standard Model (SM), assuming three generations of fermions and unitarity of the CKM matrix, the top quark decays to a W boson and a b quark almost 100% of the times, with the well known W boson decay modes fully determining the final state signature. We report on the measurement of the ratio of top quark production cross section measurements in the dilepton+jets and lepton+jets final states, using about 220 pb^{-1} of data collected by the DØ experiment at the Fermilab Tevatron collider at $\sqrt{s} = 1.96$ TeV in proton-antiproton collisions. A deviation of the measured ratio from the SM prediction may indicate the presence of new physics effects, either in the form of new resonances contaminating the $t\bar{t}$ sample or non-standard top quark decay modes.