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Abstracts book

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Abstract ID : 196

Measurement of the production fraction times branching fraction $f(b \rightarrow \Lambda_b) \cdot \mathcal{B}(\Lambda_b \rightarrow J/\psi \Lambda)$

Content :

The Λ_b baryon is observed in the decay $\Lambda_b \rightarrow J/\psi \Lambda$ using 6.1 fb^{-1} of $p\bar{p}$ collisions collected with the D0 detector at $\sqrt{s}=1.96 \text{ TeV}$. The production fraction multiplied by the branching fraction for this decay relative to that for the decay $B^0 \rightarrow J/\psi K^0_s$ is measured to be $0.345 \pm 0.034 \text{ (stat.)} \pm 0.033 \text{ (syst.)} \pm 0.003 \text{ (PDG)}$. Using the world average value of $f(b \rightarrow B^0) \cdot \mathcal{B}(B^0 \rightarrow J/\psi K^0_s) = (1.74 \pm 0.08) \times 10^{-5}$, we obtain $f(b \rightarrow \Lambda_b) \cdot \mathcal{B}(\Lambda_b \rightarrow J/\psi \Lambda) = (6.01 \pm 0.60 \text{ (stat.)} \pm 0.58 \text{ (syst.)} \pm 0.28 \text{ (PDG)}) \times 10^{-5}$. This measurement represents an improvement in precision by about a factor of three with respect to the current world average.

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Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Heavy Flavor Physics (bottom, charm, tau)

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 197

**Measurement of the relative branching
fraction of $B^0_s \rightarrow J/\psi f_0(980)$,
 $f_0(980) \rightarrow \pi^+ \pi^-$ to
 $B^0_s \rightarrow J/\psi \phi$,
 $\phi \rightarrow K^+ K^-$**

Content :

A measurement of the relative branching fraction of $B^0_s \rightarrow J/\psi f_0(980)$, $f_0(980) \rightarrow \pi^+ \pi^-$ to $B^0_s \rightarrow J/\psi \phi$, $\phi \rightarrow K^+ K^-$ is presented. The decay mode $B^0_s \rightarrow J/\psi f_0(980)$ is an interesting mode since it is a CP eigenstate and allows the measurement of the CP-violating phase ϕ_s . Using approximately 8 fb^{-1} of data recorded with the D0 detector at the Fermilab Tevatron Collider, a relative branching fraction of $0.210 \pm 0.032 \text{ (stat)} \pm 0.036 \text{ (syst)}$ is found.

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Track classification : Heavy Flavor Physics (bottom, charm, tau)

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Abstract ID : 198

Anomalous like-sign dimuon charge asymmetry at D0

Content :

We present an improved measurement of the charge asymmetry A_S of like-sign dimuon events in 9 fb^{-1} of $\overline{p}p$ collisions recorded with the D0 detector at a center-of-mass energy $\sqrt{s} = 1.96 \text{ TeV}$ at the Fermilab Tevatron collider. From A_S , we extract the like-sign dimuon charge asymmetry in semileptonic b -hadron decays. We also study the dependence of charge asymmetry on muon impact parameter. Additional constraints on the CP violation in the B meson sector are also derived from a measurement of the flavor-specific semileptonic asymmetry in the $B^0_d \rightarrow \mu^+ D^+ X$ channel.

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Track classification : CP-Violation

Contribution type : Parallel contribution

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Abstract ID : 199

Measurement of \boldsymbol{CP} violating parameters in the decay $\boldsymbol{B^0_s \to J/\psi \ \phi}$

Content :

We report a new measurement of the CP -violating phase ϕ_s , of the decay width difference for the two mass eigenstates $\Delta \Gamma_s$, of the mean B^0_s lifetime $\overline{\tau}_s$, and of magnitudes of the decay amplitudes, from the flavor-tagged decay $B^0_s \to J/\psi \ \phi$. For the first time, we consider possible contributions from the decay $B^0_s \rightarrow J/\psi K^+ K^-$, with the $K^+ K^-$ in a S wave. This measurement is based on 8 fb^{-1} of \overline{p} collisions recorded with the D0 detector at a center-of-mass energy $\sqrt{s} = 1.96 \text{ TeV}$ at the Fermilab Tevatron collider.

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Track classification : CP-Violation

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Abstract ID : 200

Precise measurement of the B^0_s lifetime

Content :

We report a new measurement of the lifetime of the B^0_s meson obtained from a sample of semileptonic $B^0_s \rightarrow D^+ \mu^- X$ decays. This analysis uses a data set corresponding to an integrated luminosity of 8.9 fb^{-1} of $\overline{p}p$ collisions recorded with the D0 detector at a center-of-mass energy $\sqrt{s} = 1.96 \text{ TeV}$ at the Fermilab Tevatron collider. This is the most precise measurement of the B^0_s reported to date.

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Abstract ID : 201

Combination D0 constraints on the CP violating phase $\boldsymbol{\phi_s}$

Content :

We present a combination of the D0 measurements of the B^0_s width difference, $\Delta\Gamma_s$, and of the CP-violating phase, ϕ_s . We include in this combination the measurement of the B^0_s mixing parameters obtained from flavor-tagged $B^0_s \rightarrow J/\psi \phi$ decays, the search for CP violation in semileptonic $B^0_s \rightarrow \mu^+ D^-_s X$ decays, the measurement of the branching ratio for the decay $B^0_s \rightarrow D^{(*)+}_s D^{(*)-}_s$ and the measurement of the like-sign asymmetry for semileptonic B^0_s decays.

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Abstract ID : 204

Measurement of
 $\sin^2\theta_{\text{eff}}^{\ell}$
and Z -light quark couplings using the
forward-backward charge asymmetry in
 $p\bar{p} \rightarrow Z/\gamma^* \rightarrow e^+e^-$
events with
 $\mathcal{L}=5.0$
 fb^{-1} at
 $\sqrt{s}=1.96$ TeV

Content :

We measure the mass dependence of the forward-backward charge asymmetry in 157,553 $p\bar{p} \rightarrow Z/\gamma^* \rightarrow e^+e^-$ interactions, corresponding to 5.0 fb^{-1} of integrated luminosity collected by the D0 experiment at the Fermilab Tevatron Collider at $\sqrt{s}=1.96$ TeV. The effective weak mixing angle ($\theta_{\text{eff}}^{\ell}$) from this process involving predominantly the first generation of quarks is extracted as $\sin^2\theta_{\text{eff}}^{\ell} = 0.2309 \pm 0.0008\text{(stat.)} \pm 0.0006\text{(syst.)}$. We also present the most precise direct measurement of the vector and axial-vector couplings of u and d quarks to the Z boson.

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Track classification : Electroweak Physics

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Abstract ID : 205

Measurement of the $\sigma(\text{ZZ})$ production cross section in $\text{p}\bar{\text{p}}$ collisions at $\sqrt{s} = 1.96 \text{ TeV}$

Content :

We present a new measurement of the production cross section $\sigma(\text{p}\bar{\text{p}} \rightarrow \text{ZZ})$ at a center-of-mass energy $\sqrt{s} = 1.96 \text{ TeV}$, obtained from the analysis of the four charged lepton final state $\ell^+ \ell^- \ell^+ \ell^-$ ($\ell = e, \mu$).

We observe ten candidate events with an expected background of 0.37 ± 0.13 events. The measured cross section $\sigma(\text{p}\bar{\text{p}} \rightarrow \text{ZZ}) = 1.26^{+0.47}_{-0.37} \text{ nb}$ is in agreement with NLO QCD predictions.

This result is combined with a previous result from the $\text{ZZ} \rightarrow \ell^+ \ell^- \nu \bar{\nu}$ channel resulting in a combined cross section of $\sigma(\text{p}\bar{\text{p}} \rightarrow \text{ZZ}) = 1.40^{+0.43}_{-0.37} \text{ nb}$.

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Abstract ID : 206

Precise study of the Z/γ^* boson transverse momentum distribution in $p\bar{p}$ collisions using a novel technique

Content :

Using 7.3-fb^{-1} of $p\bar{p}$ collisions collected by the D0 detector at the Fermilab Tevatron, we measure the distribution of the variable ϕ^*_{η} , which probes the same physical effects as the Z/γ^* boson transverse momentum, but is less susceptible to the effects of experimental resolution and efficiency.

A QCD prediction is found to describe the general features of the ϕ^*_{η} distribution, but is unable to describe its detailed shape or dependence on boson rapidity.

A prediction that includes a broadening of transverse momentum for small values of the parton momentum fraction is strongly disfavored.

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Abstract ID : 207

Measurement of the charge asymmetry in $W+X \rightarrow \mu\nu+X$ events with the D0 detector

Content :

We present a measurement of the muon charge asymmetry from $W \rightarrow \mu\nu$ decays using 7.3 fb^{-1} of data collected with D0 detector from July 2002 to July 2010. The measurement for muons with pseudorapidity $|\eta| < 2$ probes the charge asymmetry in the range of momentum fraction x from 0.005 to 0.3. The charge asymmetry is compared with the theory prediction generated from POWHEG using the CT10W and MSTW2008NLO PDFs. We also measure the charge asymmetry for muons in different transverse momentum ranges. This is the most precise lepton charge asymmetry measurement performed so far at the Tevatron.

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Track classification : Electroweak Physics

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Abstract ID : 208

Measurement of the production cross sections $\boldsymbol{p\bar{p} \rightarrow WZ}$ and $\boldsymbol{p\bar{p} \rightarrow ZZ}$ in final states with multiple leptons and missing energy with the D0 detector

Content :

Using 8.6-fb^{-1} of $p\bar{p}$ collision we obtain new measurements of the production cross sections for the production of WZ and ZZ boson pairs at $\sqrt{s}=1.96$ TeV. We consider the final states with 2 or 3 leptons and a momentum imbalance caused by the unobserved neutrino(s). The distributions of the final state products are used to investigate possible anomalous couplings in triple gauge boson vertices.

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Track classification : Electroweak Physics

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Abstract ID : 209

W boson mass and width measurements at D0

Content :

We present a precise measurement of W boson mass measurement in electron decay channel using data collected by the D0 detector at the Fermilab Tevatron collider. A binned likelihood fit method is used to extract the mass information from the transverse mass, the electron transverse momentum and missing transverse energy distributions. We also present a precise direct measurement of W boson width using the events with large transverse mass. The W mass result can be used to put stringent indirect limits on the SM Higgs boson mass.

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Track classification : Electroweak Physics

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Abstract ID : 210

$\boldsymbol{W\gamma}$ production at D0 and limits on triple gauge couplings

Content :

We describe the cross section measurement for $p\bar{p} \rightarrow W\gamma + X$ and a search for $WW\gamma$ anomalous couplings using data from the D0 experiment at the Fermilab Tevatron Collider corresponding to an integrated luminosity of 4.2 fb^{-1} . The measured cross section is in agreement with the standard model predictions and limits are set on possible anomalous triple gauge couplings. The charge-signed rapidity difference between the lepton from the W decay and the photon is used to observe the radiation-amplitude zero in the $W\gamma$ system.

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Abstract ID : 212

Measurement of three-jet differential cross sections

$\frac{d\sigma_{\text{3jet}}}{dM_{\text{3jet}}}$ in \sqrt{s} collisions at $\sqrt{s}=1.96$ TeV

Content :

We present the first measurement of the inclusive three-jet differential cross section as a function of the invariant mass of the three jets with the largest transverse momenta in an event in \sqrt{s} collisions at $\sqrt{s}=1.96$ TeV. The measurement is made in different rapidity regions and for different jet transverse momentum requirements and is based on a data set corresponding to an integrated luminosity of 0.7 fb⁻¹ collected with the D0 detector at the Fermilab Tevatron Collider. The results are used to test the three-jet matrix elements in perturbative QCD calculations at next-to-leading order in the strong coupling constant. The data allow discrimination between parametrizations of the parton distribution functions of the proton.

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 213

Azimuthal decorrelations and multiple parton interactions in $\gamma + \{2\text{-jet}\}$ and $\gamma + \{3\text{-jet}\}$ events in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV

Content :

Samples of inclusive $\gamma + \{2\text{-jet}\}$ and $\gamma + \{3\text{-jet}\}$ events collected by the D0 experiment with an integrated luminosity of about 1-fb^{-1} in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV are used to measure cross sections as a function of the angle in the plane transverse to the beam direction between the transverse momentum (p_{Tj}) of the γ -leading jet system (jets are ordered in p_{Tj}) and p_{Tj} of the other jet for $\gamma + \{2\text{-jet}\}$, or p_{Tj} sum of the two other jets for $\gamma + \{3\text{-jet}\}$ events. The results are compared to different models of multiple parton interactions (MPI) in the `pythia` and `sherpa` Monte Carlo (MC) generators. The data indicate a contribution from events with double parton (DP) interactions and are well described by predictions provided by the `pythia` MPI models with p_{Tj} -ordered showers and by `sherpa` with the default MPI model. The $\gamma + \{2\text{-jet}\}$ data are also used to determine the fraction of events with DP interactions as a function of the azimuthal angle and as a function of the second jet p_{Tj} .

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Perturbative and non-Perturbative QCD

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 214

A measurement of the ratio of inclusive cross sections $\frac{\sigma(\bar{p} \rightarrow Z + b, \text{jet})}{\sigma(\bar{p} \rightarrow Z + \text{jet})}$ at $\sqrt{s} = 1.96$ TeV

Content :

The ratio of the cross section for \bar{p} interactions producing a Z boson and at least one b quark jet to the inclusive $Z + \text{jet}$ cross section is measured using 4.2 fb^{-1} of \bar{p} collisions collected with the D0 detector at the Fermilab Tevatron collider at $\sqrt{s} = 1.96$ TeV.

The $Z \rightarrow \ell\ell$ candidate events with at least one b jet are discriminated from $Z + \text{charm}$ and light jet(s) events by a novel technique that exploits the properties of the tracks associated to the jet. The measured ratio is 0.0193 ± 0.0027 for events having a jet with transverse momentum $p_{T} > 20$ GeV and pseudorapidity $|\eta| \leq 2.5$, which is the most precise to date and is consistent with theoretical predictions.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Perturbative and non-Perturbative QCD

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 215

Measurements of inclusive W +jets production rates as a function of jet transverse momentum in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present measurements of inclusive $W(\rightarrow \ell \bar{\nu})+n$ jet cross sections ($n=1-4$), presented as total inclusive cross sections and differentially in the n^{th} jet transverse momentum and rapidity. The measurements are made using 4.2 fb^{-1} of data collected by the D0 detector at the Fermilab Tevatron Collider and achieve considerably smaller uncertainties on W +jets production than previous measurements. The measurements are compared to next-to-leading order (NLO) perturbative QCD calculations in the $n=1-3$ jet multiplicity bins and to LO pQCD calculations in the 4 jet bin. We also present differential cross section measurements for the lepton p_T and rapidity for the various jet bins, and for dijet invariant mass and rapidity difference between jets in 2 jet production. The measurements are generally in agreement with pQCD predictions, although certain regions of phase space are identified where the calculations could be improved.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Perturbative and non-Perturbative QCD

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 216

Measurement of the elastic
 $\boldsymbol{p\bar{p}}$ differential cross
section in the range
 $\boldsymbol{0.25 < |t| < 1.2}$ GeV at
 $\boldsymbol{\sqrt{s} = 1.96}$ TeV

Content :

The elastic proton-antiproton scattering process is studied as a function of the four-momentum transfer squared $|t|$ at a center-of-mass energy of 1.96 TeV. Scattered protons and antiprotons are selected by using forward roman pot detectors that were installed around the D0 interaction point of the Tevatron. The data presented correspond to a dedicated period of low luminosity running of the D0 experiment. Comparison to data from other experiments at lower energies is presented.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Perturbative and non-Perturbative QCD

Contribution type : Parallel contribution

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Abstract ID : 218

Measurements of the strong coupling constant from inclusive and multijet production in $\boldsymbol{p\bar{p}}$ collisions at $\boldsymbol{\sqrt{s}=1.96}$ TeV

Content :

The strong coupling constant α_s and its energy dependence are determined from the p_T dependence of the inclusive jet cross section in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV in the range $50 < p_T < 145$ GeV. Using perturbative QCD calculations we obtain $\alpha_s(M_Z)=0.1161^{+0.0041}_{-0.0048}$. The range in which this measurement is performed is extended to higher energies by investigating the ratio of inclusive three-jet and dijet cross sections, $R_{3/2}$, as function of transverse jet momenta and by introducing a new observable that probes spatial correlations of jets.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Perturbative and non-Perturbative QCD

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 220

Precise measurements of the top quark mass in the dilepton channel at D0

Content :

We measure the top quark mass (m_t) in $p\bar{p}$ collisions at a center of mass energy $\sqrt{s}=1.96\text{TeV}$ using dilepton $t\bar{t}\rightarrow W^+bW^-\bar{b}\rightarrow \nu_e\bar{\nu}_e b\bar{\nu}_e\bar{b}$ events, where ℓ denotes an electron, a muon, or a tau that decays leptonically. The data correspond to an integrated luminosity of 5.4fb^{-1} collected with the D0 detector at the Fermilab Tevatron Collider. We obtain $m_t = 174.0 \pm 1.8 \text{ (stat)} \pm 2.4 \text{ (syst)} \text{ GeV}$, which is in agreement with the current world average $m_t = 173.3 \pm 1.1 \text{ GeV}$. This is currently the most precise measurement of m_t in the dilepton channel. We also report a measurement obtained using the "neutrino weighting technique" in which distributions are generated from event weights obtained from comparing the calculated and reconstructed missing transverse energy.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 221

Measurements of spin correlation in $\boldsymbol{t\bar{t}}$ production at D0

Content :

We measure the correlation between the spin of the top quark and the spin of the anti-top quark in $t\bar{t} \rightarrow W^{+}W^{-}\bar{b}b$ final states produced in $p\bar{p}$ collisions at a center of mass energy $\sqrt{s}=1.96$ TeV, using data collected with the D0 detector at the Fermilab Tevatron collider. The correlation is extracted using a double differential angular distribution and a novel technique using matrix element integration is used to increase the sensitivity of the result, Measurements are performed in both the dilepton and lepton+jets final states.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 222

Search for a fourth generation t' quark in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for pair production of a fourth generation t' quark and its antiparticle, followed by their decays to a W boson and a jet, based on an integrated luminosity of 5.3 fb^{-1} of proton-antiproton collisions at $\sqrt{s}=1.96$ TeV collected by the D0 Collaboration at the Fermilab Tevatron Collider. We set upper limits on the $t'\bar{t}'$ production cross section that exclude at the 95%-C.L. a t' quark that decays exclusively to W +jet with a mass below 285 GeV. We observe a small excess in the μ +jets channel which reduces the mass range excluded compared to the expected limit of 320 GeV in the absence of a signal.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 223

Determination of the pole and \overline{m}_t masses of the top quark from the $\sigma(\bar{t}t)$ cross section

Content :

We use higher-order quantum chromodynamics calculations to extract the mass of the top quark from the $\sigma(\bar{t}t)$ cross section measured in the lepton+jets channel in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ -TeV using 5.3-fb^{-1} of integrated luminosity collected by the D0 experiment at the Fermilab Tevatron Collider. The extracted top quark pole mass and \overline{m}_t mass are compared to the current Tevatron average top quark mass obtained from direct measurements.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 224

Search for flavor changing neutral currents in decays of top quarks

Content :

We present a search for flavor changing neutral currents in decays of top quarks. The analysis is based on a search for $t\bar{t}\rightarrow\ell^+\nu\ell\bar{\ell}+jets$ ($\ell, \ell' = e, \mu$) final states using 4.1 fb^{-1} of integrated luminosity of $p\bar{p}$ collisions at $\sqrt{s} = 1.96\text{ TeV}$. We extract limits on the branching ratio $B(t\rightarrow Zq)$ ($q = u, c$ quarks), assuming anomalous tZ or $t\bar{c}Z$ couplings. We do not observe any sign of such anomalous coupling and set a limit of $B < 3.2\%$ at 95% C.L.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 225

Measurement of the top quark pair production cross section in the lepton+jets channel in proton-antiproton collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a measurement of the inclusive top quark pair production cross section in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV utilizing data corresponding to an integrated luminosity of 5.3-fb^{-1} collected with the D0 detector at the Fermilab Tevatron Collider.

We consider final states containing one high- p_T isolated electron or muon and at least two jets, and we perform three analyses: one exploiting specific kinematic features of $t\bar{t}$ events, the second using b -jet identification, and the third using both techniques to separate $t\bar{t}$ signal from background.

In the third case, we determine simultaneously the $t\bar{t}$ cross section and the ratio of the production rates of W +heavy flavor jets and W +light flavor jets, which reduces the impact of the systematic uncertainties related to the background estimation. Assuming a top quark mass of 172.5 GeV, we obtain $\sigma_{t\bar{t}} = 7.78^{+0.77}_{-0.64}$ pb. This result agrees with predictions of the standard model.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 226

Measurement of color flow in \bar{t} events from $\bar{p}p$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present the first measurement of the color representation of the hadronically decaying W boson in \bar{t} events, from 5.3 fb^{-1} of integrated luminosity collected with the D0 experiment. A novel calorimeter-based vectorial variable, "jet pull," is used, sensitive to the color-flow structure of the final state. We find that the fraction of uncolored W bosons is $0.56 \pm 0.42 \text{ (stat+syst)}$, in agreement with the standard model.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 227

Search for $\boldsymbol{W\{\prime\}\rightarrow tb}$ resonances with left- and right-handed couplings to fermions

Content :

We present a search for the production of a heavy gauge boson, $W\{\prime\}$, that decays to third-generation quarks, by the D0 Collaboration in $p\bar{p}$ collisions at $\sqrt{s} = 1.96\text{-TeV}$. We set 95% confidence level upper limits on the production cross section times branching fraction. For the first time, we set limits for arbitrary combinations of left- and right-handed couplings of the $W\{\prime\}$ boson to fermions. For couplings with the same strength as the standard model W boson, we set the following limits for $M(W\{\prime\}) > m(\nu_R)$: $M(W\{\prime\}) > 863\text{-GeV}$ for purely left-handed couplings, $M(W\{\prime\}) > 885\text{-GeV}$ for purely right-handed couplings, and $M(W\{\prime\}) > 916\text{-GeV}$ if both left- and right-handed couplings are present. The limit for right-handed couplings improves for $M(W\{\prime\}) < m(\nu_R)$ to $M(W\{\prime\}) > 890\text{-GeV}$.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 228

Measurement of the W boson helicity in top quark decays using 5.4 fb⁻¹ of $p\bar{p}$ collision data

Content :

We present a measurement of the helicity of the W boson produced in top quark decays using $t\bar{t}$ decays in the $\ell\ell+\text{jets}$ and dilepton final states selected from a sample of 5.4 fb⁻¹ of collisions recorded using the D0 detector at the Fermilab Tevatron $p\bar{p}$ collider. We measure the fractions of longitudinal and right-handed W bosons to be $f_0 = 0.669 \pm 0.102$ [± 0.078 (stat.) ± 0.065 (syst.)] and $f_{\pm} = 0.023 \pm 0.053$ [± 0.041 (stat.) ± 0.034 (syst.)], respectively. This result is consistent at the 98% level with the standard model. A measurement with f_0 fixed to the value from the standard model yields $f_{\pm} = 0.010 \pm 0.037$ [± 0.022 (stat.) ± 0.030 (syst.)]

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 229

Determination of the width of the top quark

Content :

We extract the total width of the top quark, Γ_t , from the partial decay width $\Gamma(t \rightarrow Wb)$ measured using the t -channel cross section for single top quark production and from the branching fraction $\mathcal{B}(t \rightarrow Wb)$ measured in $t\bar{t}$ events using up to 2.3-fb^{-1} of integrated luminosity collected by the D0 Collaboration at the Tevatron $p\bar{p}$ Collider. The result is $\Gamma_t = 1.99^{+0.69}_{-0.55}\text{ GeV}$, which translates to a top-quark lifetime of $\tau_t = (3.3^{+1.3}_{-0.9}) \times 10^{-25}\text{ s}$.

Assuming a high mass fourth generation b' quark and unitarity of the four-generation quark-mixing matrix, we set the first upper limit on $|V_{tb'}| < 0.63$ at 95% C.L.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 230

Measurement of τ production in the $\tau +$ jets topology using $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV

Content :

We present a measurement of the τ production cross section multiplied by the branching ratio to tau lepton decaying semihadronically (τ_h) plus jets,

$$\sigma(p\bar{p} \rightarrow \tau + X)$$

$$\cdot \text{BR}(\tau \rightarrow \tau_h + \text{jets}),$$

at a center of mass energy $\sqrt{s} = 1.96$ TeV using

10^{-1} of integrated luminosity collected with the D0

detector. Assuming a top quark mass of 170 GeV,

we measure

$$\sigma_{\tau} \cdot \text{BR}(\tau \rightarrow \tau_h + j) = 0.60^{+0.23}_{-0.22} (\text{stat})^{+0.15}_{-0.14};$$

$(\text{syst}) \pm 0.04 (\text{lumi}) \text{ pb}$. In addition,

we extract the τ production cross section using the $\tau \rightarrow \tau_h + \text{jets}$ topology, with the result

$$\sigma_{\tau} =$$

$$6.9^{+1.2}_{-1.2} (\text{stat})^{+0.7}_{-0.8} (\text{syst})$$

$\pm 0.4 (\text{lumi}) \text{ pb}$. These findings are in

good agreement with standard model

predictions and measurements performed using other top quark decay channels.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 231

Model-independent measurement of t -channel single top quark production in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV

Content :

We present a model-independent measurement of t -channel electroweak production of single top quarks in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ 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 $\sigma(p\bar{p} \rightarrow t b q + X) = 2.90 \pm 0.59 \text{ pb}$ for a top quark mass of 172.5 GeV. We estimate the probability of the background to fluctuate and produce a signal as large as the one observed to be 1.6×10^{-8} , corresponding to a significance of 5.5 standard deviations.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 232

Precise measurement of the top-quark mass from lepton+jets events at D0

Content :

We report a measurement of the mass of the top quark in lepton+jets final states of $p\bar{p} \rightarrow t\bar{t}$ data corresponding to 2.6 fb^{-1} of integrated luminosity collected by the D0 experiment at the Fermilab Tevatron Collider. Using a matrix element method, we combine an in situ jet energy calibration with a constraint imposed from the standard jet energy scale derived in studies of γ +jet and dijet events and we measure a top-quark mass of $m_t = 176.01 \pm 1.64 \text{ GeV}$. Combining this result with that from a previous analysis yields a total data sample corresponding to 3.6 fb^{-1} of integrated luminosity and a top-quark mass of $m_t = 174.94 \pm 1.49 \text{ GeV}$.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 233

Direct measurement of the mass difference between top and antitop quarks

Content :

We present a direct measurement of the mass difference between top and antitop quarks (Δm) in lepton+jets $t\bar{t}$ final states using the “matrix element” method. The purity of the lepton+jets sample is enhanced for $t\bar{t}$ events by applying a neural-network-based b -jet identification technique. The analyzed data correspond to 3.6 fb^{-1} of $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV acquired by D0 in Run II of the Fermilab Tevatron Collider. The combination of the e +jets and μ +jets channels yields $\Delta m = 0.8 \pm 1.8 \text{ (stat)} \pm 0.5 \text{ (syst)}$ GeV, which is in agreement with the standard model prediction of no mass difference.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 234

Measurement of the $\boldsymbol{t\bar{t}}$ production cross section using dilepton events in $\boldsymbol{p\bar{p}}$ collisions

Content :

We present a measurement of the $t\bar{t}$ production cross section in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV using 5.4 fb^{-1} of data collected with the D0 detector. We consider final states with at least two jets and two leptons (ee , $e\mu$, $\mu\mu$), and events with one jet for the $e\mu$ final state as well.

The measured cross section is $7.4^{+0.9}_{-0.8}(\text{stat + syst})$ pb.

This result combined with the cross section measurement

in the lepton + jets final state yields a cross section of $7.6 \pm 0.6(\text{stat + syst})$ pb which agrees with the standard model expectation and represents a relative precision of 8% reaching an uncertainty comparable to the latest theoretical calculations.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

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Abstract ID : 235

Combination of the D0 top quark mass measurements

Content :

We present a combination of the top quark mass measurements performed by the D0 experiment in lepton plus jets ($\ell\ell+jets$) and dilepton ($\ell\ell\ell\ell$) channels. The combined result yields $m_{top}=175.08\pm 1.47(\text{stat+syst})$ GeV.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 236

Measurement of the ratio $\boldsymbol{B(t \to Wb)/B(t \to Wq)}$ in the lepton+jets and dilepton $t\bar{t}$ final states at D0

Content :

We present a measurement of the ratio of top quark branching fractions $R = B(t \to Wb)/B(t \to Wq)$, where q can be a d , s or b quark, in the lepton+jets and dilepton final states. The measurement uses a data sample of 5.4 fb^{-1} of $p\bar{p}$ collisions collected with the D0 detector. We find a value of R compatible with the Standard Model expectation and set a limit on the CKM matrix element $|V_{tb}|$ assuming the CKM matrix unitarity.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 237

Measurement of the forward-backward charge asymmetry in top quark production in $\boldsymbol{p\bar{p}}$ collisions at $\boldsymbol{\sqrt{s} = 1.96}$ TeV

Content :

We present measurements of the integrated forward-backward charge asymmetry in $t\bar{t}$ production in $p\bar{p}$ collisions using data collected with the D0 detector at the Fermilab Tevatron collider, using both the lepton+jets and dilepton final states. We present the raw measurement as well as results obtained after correcting for acceptance and detector effects and present also measurements as a function of invariant mass of the $t\bar{t}$ pair. We also investigate the dependence of the asymmetry on the total transverse momentum of the $t\bar{t}$ pair.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 238

Search for \boldsymbol{CP} violation in single top production

Content :

We present a search for CP violation in single top quark production at the D0 experiment at the Fermilab Tevatron. CP violation in the top electroweak interaction results in different single top quark production cross sections for top and antitop quarks. We consider the asymmetry in the total number of leptons (ℓ^+ and ℓ^-) in the final state. We perform the search separately in the electron+jets and muon+jets final states using 5.4 fb^{-1} of data collected with the D0 detector.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 239

Search for anomalous top quark couplings in single top events at D0

Content :

Anomalous Wtb couplings can change the single top quark production cross section. We present limits on anomalous top quark couplings by searching for anomalous production in the single top quark final state.

We set limits on right-handed vector couplings as well as left-handed and right-handed tensor couplings based on data collected by the D0 experiment.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 240

Search for charged Higgs Boson decaying into top and bottom quarks

Content :

We present an improved search for quark fusion production $q\bar{q} \rightarrow H^{\pm} + \bar{b}$ of the charged Higgs boson reconstructed in the \bar{b} final state using 5.4 fb^{-1} of data collected by the D0 detector.

We find no evidence for charged Higgs production and set limits on the production cross-section for a variety of theoretical models.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 241

Search for the Standard Model higgs boson in the $t\bar{t}H \rightarrow t\bar{t}b\bar{b}$ channel at D0

Content :

We present a search for the Standard Model Higgs boson produced in association with top anti-top quark pairs. This analysis considers samples of lepton+jets events with one, two or three b-tagged jets and four, five or more jets in total collected with the D0 detector, corresponding to an integrated luminosity of 5.4 fb^{-1} . Kinematical differences between $t\bar{t}$ and $t\bar{t}H$ events are exploited and limits are set on the $t\bar{t}H \rightarrow t\bar{t}b\bar{b}$ production cross section.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 242

Measurements of differential distributions of top quarks with the D0 detector

Content :

We present measurements of differential distributions for top quarks produced in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV using 7 fb^{-1} of data collected with the D0 detector at the Fermilab Tevatron collider. These differential distributions can be used to validate current Monte Carlo generators and their level of description of the top quark pairs and provide a detailed window on QCD dynamics of a unique heavy diquark system at large scales. We use a sample consisting of events containing a high p_T lepto, large missing transverse energy, and four or more jets of which one is required to be identified as a b jet. of the jets was required to be identified as a b jet. The measured spectra, binned in several observables, are compared to those obtained from the Monte Carlo simulation.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 244

Heavy flavor production in association with W bosons at D0

Content :

Measurements of W boson production in association with heavy flavor jets are important tests of LO and NLO QCD predictions and crucial for the precision study of processes such as top and diboson production as well as searches for Higgs production and other new physics both at the Tevatron and LHC.

We present a measurement of the heavy flavor content in the W +jet production mode in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV using the D0 detector Fermilab in RunII is presented. The measurement is based on an integrated luminosity of 6 fb^{-1} , and includes events with up to two jets. The measurements are unfolded to particle level to account for detector effects and the data are compared to predictions from Monte Carlo simulations.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Perturbative and non-Perturbative QCD

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 248

Search for resonant WW and WZ production in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV

Content :

We search for resonant WW - or WZ -production using up to 5.4 fb^{-1} of integrated luminosity collected by the D0-experiment in Run II of the Fermilab Tevatron Collider. The data are consistent with the standard model background expectation, and we set limits on a resonance mass using the sequential standard model (SSM) W -boson and the Randall-Sundrum model graviton G -as benchmarks. We exclude an SSM W -boson in the mass range $180\text{--}690 \text{ GeV}$ and a Randall-Sundrum graviton in the range $300\text{--}754 \text{ GeV}$ at 95% -CL.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 249

Search for single vector-like quarks in $\boldsymbol{p\bar{p}}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for hypothetical vector-like quarks in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV. The data were collected by the D0 detector at the Fermilab Tevatron Collider and correspond to an integrated luminosity of 5.4-fb^{-1} . We select events with a final state composed of a W or Z boson and a jet consistent with a heavy object decay. We observe no significant excess in comparison to the background prediction and set limits on production cross sections for vector-like quarks decaying to W +jet and Z +jet. These are the most stringent limits to date for electroweak single vector-like quark production at hadron colliders.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 250

Search for pair production of the scalar top quark in the $e^+\mu$ and $\mu^+\tau$ final states

Content :

We report the result of a search for the pair production of the lightest supersymmetric partner of the top quark (\tilde{t}_1) in $p\bar{p}$ collisions at a center-of-mass energy of 1.96 TeV at the Fermilab Tevatron collider corresponding to an integrated luminosity of 5.4 fb^{-1} .

The scalar top quarks are assumed to decay into a b quark, a charged lepton, and a scalar neutrino ($\tilde{\nu}$), and the search is performed in the $e^+\mu$ and $\mu^+\tau$ final states. No significant excess of events above the standard model prediction is detected, and improved exclusion limits at the 95% C.L. are set in the $(M_{\tilde{t}_1}, M_{\tilde{\nu}})$ mass plane.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 251

Search for diphoton events with large missing transverse energy in 6.3 fb^{-1} of $\boldsymbol{p\bar{p}}$ collisions at $\boldsymbol{\sqrt{s}=1.96} \text{ TeV}$

Content :

We report a search for diphoton events with large missing transverse energy produced in $p\bar{p}$ collisions at $\sqrt{s}=1.96 \text{ TeV}$. The data were collected with the D0 detector at the Fermilab Tevatron Collider, and correspond to 6.3 fb^{-1} of integrated luminosity. The observed missing transverse energy distribution is well described by the standard model prediction, and 95%-C.L. limits are derived on two realizations of theories beyond the standard model. In a gauge mediated supersymmetry breaking scenario, the breaking scale Λ is excluded for $\Lambda < 124 \text{ TeV}$. In a universal extra dimension model including gravitational decays, the compactification radius R_c is excluded for $R_c^{-1} < 477 \text{ GeV}$.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 252

Search for new fermions ("quirks") at the Fermilab Tevatron Collider

Content :

We report results of a search for particles with anomalously high ionization in events with a high transverse energy jet and large missing transverse energy in 2.4 fb^{-1} of integrated luminosity collected by the D0 experiment at the Fermilab Tevatron $p\bar{p}$ collider. Production of such particles (quirks) is expected in scenarios with extra QCD-like $SU(N)$ sectors, and this study is the first dedicated search for such signatures.

We find no evidence of a signal and set a lower mass limit of 107-GeV, 119-GeV and 133-GeV for the mass of a charged quirk with strong dynamics scale Λ in the range from 10 keV to 1 MeV and $N=2,3,5$, respectively.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 253

Search for events with leptonic jets and missing transverse energy in \sqrt{s} collisions at $\sqrt{s}=1.96$ TeV

Content :

We present the first search for pair production of isolated jets of charged leptons in association with a large imbalance in transverse energy in $p\bar{p}$ collisions using 5.8-fb^{-1} of integrated luminosity collected by the D0 detector at the Fermilab Tevatron Collider. No excess is observed above Standard Model background, and the result is used to set upper limits on the production cross section of pairs of supersymmetric chargino and neutralino particles as a function of "dark-photon" mass, where the dark photon is produced in the decay of the lightest supersymmetric particle.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 254

Search for a heavy neutral gauge boson in the dielectron channel with $5.4 \sim \text{fb}^{-1}$ of $\boldsymbol{p\bar{p}}$ collisions at $\boldsymbol{\sqrt{s} = 1.96} \sim \text{TeV}$

Content :

We report the results of a search for a heavy neutral gauge boson Z' decaying into the dielectron final state using data corresponding to an integrated luminosity of $5.4 \sim \text{fb}^{-1}$ collected by the D0 experiment at the Fermilab Tevatron Collider. No significant excess above the standard model prediction is observed in the dielectron invariant-mass spectrum. We set 95% C.L. upper limits on $\sigma \left(p\bar{p} \rightarrow Z' \right) \times \text{BR}(Z' \rightarrow ee)$ depending on the dielectron invariant mass. These cross section limits are used to determine lower mass limits for Z' bosons in a variety of models. For the sequential standard model Z' boson a lower mass limit of $1023 \sim \text{GeV}$ is obtained.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 255

Model independent search for new phenomena in $\boldsymbol{p\bar{p}}$ collisions at $\boldsymbol{\sqrt{s} = 1.96}$ TeV

Content :

We present a model independent search for physics beyond the standard model in lepton final states. We examine data in 120 unique final states from 1.07 fb^{-1} of $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV collected with the D0 detector. We conclude that all discrepancies seen can be attributed to modeling issues and do not claim evidence of new physics.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 257

A search for charged massive long-lived particles at D0

Content :

We report on a search for charged massive long-lived particles (CMLLPs), based on 5.2 fb^{-1} of data collected with the D0 detector at the Fermilab Tevatron $p\bar{p}$ collider. CMLLPs are predicted in many theories of physics beyond the Standard Model. We look for events in which one or more particles are reconstructed as muons but have speed and ionization energy loss dE/dx inconsistent with muons produced in beam collisions. We present 95% C.L. upper limits on the production cross section for $\tilde{\tau}$ and exclusion mass ranges for $\tilde{\chi}^{\pm}$ in two SUSY scenarios and for long-lived \tilde{t} squarks.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 258

Search for supersymmetry with the $\boldsymbol{Z\gamma}$ plus missing energy final state

Content :

A first search for a supersymmetry signature with events containing $Z\gamma$ and large missing transverse energy is conducted using 6.2 fb^{-1} of data collected by the D0 experiment in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV. This signature is predicted in a gauge mediated supersymmetry breaking (GMSB) model in which pairs of neutralinos or charginos are produced and decay via lighter higgsino-like neutralinos. These neutralinos further decay to either a Z or a photon plus an undetected gravitino. Limits are set at the 95% C.L. on the breaking scale GMSB model and on the neutralino masses.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 259

Search for first generation leptoquark pair
production in the electron +
 \not{E} +
jets final state in 5.4
fb of
 $p\bar{p}$ collision data at
 $\sqrt{s}=1.96$ TeV

Content :

We present a search for pair production of first generation scalar leptoquarks (LQ) in 5.4 fb of data collected with the D0 detector at the Fermilab Tevatron collider in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV. In the channel $LQ\bar{LQ} \rightarrow e^+q\nu_e q'$, no significant excess of data over the background prediction is observed and we set 95% C.L. lower limit on the leptoquark mass.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

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Abstract ID : 260

Search for universal extra dimensions and supersymmetry in like-sign dimuon events using 7.3 fb^{-1} of D0 data

Content :

We present a search for universal extra dimensions (UED) and supersymmetry (SUSY) in the two like-sign muons final state. The data set corresponds to an integrated luminosity of 7.3 fb^{-1} collected by the D0 detector at a \sqrt{s} center of mass energy of 1.96 TeV at the Fermilab Tevatron Collider. No evidence for physics beyond the standard model is observed and limits are set on the size of the compactification scale R_c^{-1} in the minimal UED model and on the SUSY parameter space in supergravity inspired models.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract ID : 261

Search for associated production of charginos and neutralinos in the trilepton final state using 7.3 fb^{-1} of data

Content :

We report the results of a search for associated production of charginos and neutralinos using a data set corresponding to an integrated luminosity of 7.3 fb^{-1} collected with the D0 experiment during Run II of the Tevatron proton-antiproton collider. Final states containing three charged leptons and missing transverse energy are probed for a signal from supersymmetry with four dedicated trilepton event selections. No evidence for a signal is observed, and we set limits on the product of production cross section and leptonic branching fraction.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Beyond the Standard Model

Contribution type : Parallel contribution

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Abstract ID : 263

Search for associated production of W and Higgs bosons in $\ell\nu b\bar{b}$ final states in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for a low mass Standard Model Higgs boson produced in association with a W boson at a center-of-mass energy of $\sqrt{s}=1.96$ -TeV with the D0 detector at the Fermilab Tevatron collider. The search is performed in events containing one lepton (electron, muon or tau), an imbalance in the transverse energy, and one or two b -tagged jets with up to 8.5-fb^{-1} of data. This channel is one of the most powerful in the search for a low mass Higgs at the Tevatron. Inclusion of the full data set and recent sensitivity improvements will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 264

Search for associated production of Z and Higgs bosons in $\nu\nu b\bar{b}$ final states in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for a low mass Standard Model Higgs boson produced in association with a Z boson decaying invisibly into a pair of neutrinos at a center-of-mass energy of $\sqrt{s}=1.96$ TeV with the D0 detector at the Fermilab Tevatron collider. The final state is characterised by the presence of two b-tagged jets from the Higgs boson decay and a large imbalance in the transverse energy of the event. This channel is very powerful because of the large signal yields, but is experimentally challenging due to the large QCD backgrounds and absence of visible leptons in the final state. Inclusion of the full data set, up to 8.5 fb^{-1} , and recent improvements to the sensitivity will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 265

Search for associated production of Z and Higgs bosons in $\ell\ell b\bar{b}$ final states in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for a low mass Standard Model Higgs boson produced in association with a Z boson decaying to charged leptons at a center-of-mass energy of $\sqrt{s}=1.96$ TeV with the D0 detector at the Fermilab Tevatron collider. The search is performed in events containing two opposite-sign leptons (electron or muon) and one or two b-tagged jets with up to 8.5-fb^{-1} of data. Inclusion of the full data set and recent sensitivity improvements will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 266

Search for the Standard Model Higgs boson in the $\tau\tau q\bar{q}$ final state in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for a Standard Model Higgs boson in events with a final state containing two taus and two jets, in which one tau decays to either a muon or an electron and the other tau decays to hadrons at a center-of-mass energy of $\sqrt{s}=1.96$ TeV with the D0 detector at the Fermilab Tevatron collider. The final states are sensitive to a combination of associated production of a W/Z boson with a Higgs boson, vector boson fusion and gluon-gluon fusion production processes. Inclusion of data up to 7.3fb^{-1} , and recent improvements to the sensitivity will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 267

Search for the Higgs boson in the $WW^{(*)} \rightarrow \ell\ell'$ decays at $\sqrt{s}=1.96$ TeV

Content :

We present a search for the Standard Model Higgs boson produced via the $H \rightarrow WW^{(*)} \rightarrow \ell\ell'+\ell\ell'-\ell\ell$ ($\ell\ell, \ell\ell' = e, \mu, \tau$) process at a center-of-mass energy of $\sqrt{s}=1.96$ TeV with the D0 detector at the Fermilab Tevatron collider. A Higgs particle with a mass greater than 140 GeV primarily decays into a pair of W -bosons and the leptonic decay channels of the W provide a clear signature. This channel provides the greatest sensitivity to the Higgs boson at the Tevatron, and sensitivity to the Standard Model Higgs is expected with this data set. Inclusion of the full data set, approximately 8.5-fb^{-1} , and recent improvements to the sensitivity will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 268

Search for the Higgs boson in the $VH \rightarrow VWW^{(*)} \rightarrow \ell \ell' + X$ decays in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for the Standard Model Higgs boson produced via the $VH \rightarrow VWW^{(*)} \rightarrow \ell \ell' + X$ process at a center-of-mass energy of $\sqrt{s}=1.96$ -TeV with the D0 detector at the Fermilab Tevatron collider. We require two like-sign leptons (electrons or muons). This channel provides significant sensitivity in the intermediate Higgs boson mass range. Inclusion of data up to 7.3-fb^{-1} , and recent improvements to the sensitivity will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 269

Search for the Higgs boson in the $VH \rightarrow VWW^{*} \rightarrow \ell\ell\ell + X$ decays in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV

Content :

We present a search for the Standard Model Higgs boson produced via the $VH \rightarrow VWW^{*} \rightarrow \ell\ell\ell + X$ process at a center-of-mass energy of $\sqrt{s} = 1.96$ TeV with the D0 detector at the Fermilab Tevatron collider. We require three identified leptons (electrons or muons). This channel provides significant sensitivity in the intermediate Higgs boson mass range. Inclusion of data up to 7.3 fb^{-1} , and recent improvements to the sensitivity will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 270

Search for the Higgs boson in the $H \rightarrow \gamma\gamma$ decays in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for Higgs bosons decaying to the di-photon final state using up to 8.5-fb^{-1} of data at a center-of-mass energy of $\sqrt{s}=1.96\text{-TeV}$ with the D0 detector at the Fermilab Tevatron collider. Both gluon fusion and associated production processes are exploited. Whilst the branching ratio to the diphoton final state is small in the Standard Model, this channel contributes appreciably to the overall Higgs sensitivity at Tevatron. In parallel, the limit is interpreted in fermiophobic models where the diphoton branching ratio is considerably larger. This decay channel will be of major importance in the light mass Standard Model Higgs search at the LHC.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Abstract ID : 271

Search for the Higgs boson in semileptonic $WW^{(*)}$ decays in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for the Standard Model Higgs boson produced via the $H \rightarrow WW^{(*)} \rightarrow \ell\nu jj$ process at a center-of-mass energy of $\sqrt{s}=1.96$ TeV using up to 8.5-fb^{-1} of data collected with the D0 detector at the Fermilab Tevatron collider. We search in events with one lepton (electron or muon), two jets and missing transverse energy. A Higgs particle with a mass greater than 140 GeV primarily decays into a pair of W -bosons. Whilst the di-lepton channels provide a clean signature, the semi-leptonic decay mode has a significantly larger cross section times branching ratio. While this channel presents the possibility of directly reconstructing the Higgs mass, the difficulty resides in overcoming the very large W +jets background, and the procedures developed to achieve this will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 272

Search for the Higgs boson in semileptonic $\boldsymbol{ZZ^{(*)} \rightarrow \ell\ell^{+-} jj}$ final state in $\boldsymbol{p\bar{p}}$ collisions at $\boldsymbol{\sqrt{s}=1.96}$ TeV

Content :

We present a search for the Standard Model Higgs boson produced via the $H \rightarrow ZZ^{(*)}$ process at a center-of-mass energy of $\sqrt{s}=1.96$ TeV using up to 8.5 fb^{-1} of data collected with the D0 detector at the Fermilab Tevatron collider. We search in events with two charged leptons (electron or muon) and two jets. While this channel presents the possibility of directly reconstructing the Higgs mass, the difficulty resides in overcoming the very large ZZ +jets background, and the procedures developed to achieve this will be discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Monday 16 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 273

Combined upper limit on Standard Model Higgs boson production in $\sqrt{s}=1.96$ TeV at D0

Content :

We present the combination of the searches for the Standard Model Higgs boson at a center-of-mass energy of $\sqrt{s}=1.96$ TeV, using up to 8.5-fb^{-1} of data collected with the D0 detector at the Fermilab Tevatron collider. The major contributing processes include associated production ($WH\to e\ell\nu b\bar{b}$, $ZH\to\nu\nu b\bar{b}$, $ZH\to e\ell e\ell b\bar{b}$, and $WH\to WW^{(*)}$) and gluon fusion ($gg\to H\to WW^{(*)}$). The significant improvements across the full mass range resulting from the larger data sets, improved analyses and inclusion of additional channels are discussed. The combination of all channels results in significantly improved sensitivity across the 100-200 GeV mass range, and in particular around 160 GeV.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

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Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 274

Measurement of diboson production in lepton plus jets decays in \sqrt{s} collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a measurement of the cross section for the simultaneous production of two vector bosons (WW , WZ , ZZ) in lepton plus jets decays at a center-of-mass energy of $\sqrt{s}=1.96$ TeV using up to 5.4 fb^{-1} of data collected with the D0 detector. This final state is a direct analog to SM Higgs searches in final states of leptons plus bottom quark pairs, and thus provides a crucial validation benchmark of the Higgs boson signal isolation techniques involved.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 275

Measurement of $\sigma(\text{WZ}/\text{ZZ}; \text{Z} \rightarrow \text{b}\bar{\text{b}})$ production cross section in $\text{p}\bar{\text{p}}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a measurement of the cross section for the simultaneous production of two vector bosons (WZ,ZZ), where one of the bosons

decays leptonically ($\text{W} \rightarrow \ell\bar{\nu}$, $\text{Z} \rightarrow \ell\ell^+\ell\ell^-$ or $\text{Z} \rightarrow \nu\bar{\nu}$) and the other ZZ boson decays to $\text{b}\bar{\text{b}}$.

The measurement uses up to 8.5-fb^{-1} of data collected with the D0 detector in $\text{p}\bar{\text{p}}$ collisions at $\sqrt{s}=1.96\text{-TeV}$,

and combines the three leptonic decay modes mentioned above. This final state is a direct analog to SM Higgs searches in final

states of leptons plus bottom quark pairs, and thus provides a crucial validation benchmark of the Higgs boson signal isolation

techniques involved.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 276

Study of the dijet invariant mass distribution in $W+2$ jet candidate events in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a study of the dijet invariant mass spectrum in events with at least two jets produced in association with a W boson, using data collected with the D0 detector which correspond to an integrated luminosity of 4.3 fb^{-1} . We perform a detailed comparison of the observed distribution with the background prediction, taking into account systematic uncertainties, to check the presence of an excess in the 120-160 GeV region recently claimed by the CDF Collaboration.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 277

Search for neutral Supersymmetric Higgs bosons in $\boldsymbol{bbb(b)}$ final states in $\boldsymbol{p\bar{p}}$ collisions at $\boldsymbol{\sqrt{s}=1.96}$ TeV

Content :

We present a search for Higgs bosons in the $b\bar{b}$ and $bb\bar{b}$ channels at a center-of-mass energy of $\sqrt{s}=1.96$ -TeV using up to 8.5-fb^{-1} of data collected with the D0 detector. In many Supersymmetric models the cross-section for production of neutral Higgs bosons in association with bottom quarks is greatly enhanced compared to the Standard Model, and over much of the parameter space the dominant decay process is $b\bar{b}$. We search for an excess of events above the multijet background in events with 3 and 4 b -jets. Understanding the multijet background in this channel is particularly challenging. The treatment of the background, the multivariate techniques used to improve the sensitivity and the limit setting procedure are discussed.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 278

Search for neutral Supersymmetric Higgs bosons in di- τ final states in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present a search for Higgs bosons in the di-tau modes at a center-of-mass energy of $\sqrt{s}=1.96$ -TeV using up to 5.4-fb^{-1} of data collected with the D0 detector at the Fermilab Tevatron collider. In Supersymmetric models Higgs boson production cross section can be significantly enhanced compared to the Standard Model. In such models, the Higgs boson has a significant branching ratio to τ leptons at all masses, and the gluon fusion production process can be exploited directly. The di- τ channels complement the bb associated production modes through reduced dependence on the details of the Supersymmetric model under test.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 279

Search for neutral Supersymmetric Higgs bosons in $\boldsymbol{b\tau\tau}$ final states in $\boldsymbol{p\bar{p}}$ collisions at $\boldsymbol{\sqrt{s}=1.96}$ TeV

Content :

We present a search for Higgs bosons produced via the associated $p\bar{p} \rightarrow h+b \rightarrow \tau^+\tau^-b$ process at a center-of-mass energy of $\sqrt{s}=1.96$ TeV using up to 7.3-fb^{-1} of data collected with the D0 detector at the Fermilab Tevatron collider. In Supersymmetric models Higgs boson production cross section can be significantly enhanced compared to the Standard Model; additionally the Higgs boson has a significant branching ratio to τ leptons at all masses. This hybrid $b\tau$ channel complements the $d\tau$ search channel, in particular providing sensitivity around the M_Z mass.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 280

Combined upper limits on MSSM Higgs boson production with up to 8.5 fb⁻¹ of data at D0

Content :

We present the combination of the searches for neutral Supersymmetric Higgs bosons at a center-of-mass energy of $\sqrt{s}=1.96\text{-TeV}$, using up to 8.5-fb⁻¹ of data collected with the D0 detector at the Fermilab Tevatron collider. The searches considered cover the main production and decay mechanisms for Higgs bosons in these models: $g\bar{g}, b\bar{b} \rightarrow h \rightarrow \tau^+\tau^-$, $h(b) \rightarrow b\bar{b}$ and $h(b) \rightarrow \tau^+\tau^-(b)$. The resulting combination is interpreted in the context of different scenarios within the Minimal Supersymmetric Standard Model.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 281

Search for doubly charged Higgs boson production in

$\mathbf{H^{\pm\pm} \rightarrow \tau\tau, \mu\mu, \mu\tau}$
in $\mathbf{p\bar{p}}$ collisions at
 $\mathbf{\sqrt{s}=1.96}$ TeV

Content :

We present a search for pair production of doubly charged Higgs boson in the processes $q\bar{q} \rightarrow H^{++}H^{--}$ decaying through $H^{\pm\pm} \rightarrow \tau\tau, \mu\mu, \mu\tau$. The search is performed in $p\bar{p}$ collisions at a centre of mass energy of 1.96 TeV using an integrated luminosity of 7-fb^{-1} collected by the D0 experiment at the Fermilab Tevatron Collider. This represents the first search for pair production of doubly-charged Higgs bosons decaying into tau leptons at a hadron collider.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 282

Combined CDF and D0 upper limits on Standard Model Higgs boson production at the Tevatron in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present the combined results from the CDF and D0 Collaborations on direct searches for a standard model Higgs boson in $p\bar{p}$ collisions at the Fermilab Tevatron at $\sqrt{s} = 1.96$ TeV. The major contributing processes include associated production ($WH \rightarrow \ell\nu b\bar{b}$, $ZH \rightarrow \nu\nu b\bar{b}$, $ZH \rightarrow \ell\ell b\bar{b}$, and $WH \rightarrow WW^{(*)}$) and gluon fusion ($gg \rightarrow H \rightarrow WW^{(*)}$). Compared to the previous Tevatron Higgs search combination more data have been added and some previously used channels have been reanalyzed to gain sensitivity. The combination of all channels results in significantly improved sensitivity across the 100-200 GeV mass range, in particular around 160 GeV.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the CDF and D0 Collaborations. Once the program of parallel sessions has been settled, please contact Giorgio Chiarelli (giorgio.chiarelli@pi.infn.it), head of the CDF Speaker's Committee, and Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 283

Combined CDF and D0 upper limit on Standard Model $H \rightarrow \gamma\gamma$ decays in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present combined results on the search for the Standard Model Higgs boson decaying to the di-photon final state using up to 8.5-fb^{-1} of data at a center-of-mass energy of $\sqrt{s}=1.96\text{-TeV}$ collected with the CDF and D0 detectors at the Fermilab Tevatron collider. Both gluon fusion and associated production processes are exploited. Whilst the branching ratio to the di-photon final state is small in the Standard Model, this channel contributes appreciably to the overall Higgs sensitivity at the Tevatron. This decay channel will be of major importance in the light mass Standard Model Higgs search at the LHC.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the CDF and D0 Collaborations. Once the program of parallel sessions has been settled, please contact Giorgio Chiarelli (giorgio.chiarelli@pi.infn.it), head of the CDF Speaker's Committee, and Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 284

Combined CDF and D0 upper limit on $\boldsymbol{gg \rightarrow H \rightarrow W^+W^-, \gamma\gamma, ZZ}$ and constraints on the Higgs boson mass in fourth generation models

Content :

We present the combined results from CDF and D0 on direct searches for a standard model Higgs boson in the process $gg \rightarrow H \rightarrow W^+W^-, \gamma\gamma, ZZ$ in $p\bar{p}$ collisions at the Fermilab Tevatron at $\sqrt{s}=1.96$ TeV. We derive limits on the Higgs Boson mass assuming the presence of a sequential generation of fermions with large masses, which results in a significant enhancement of the gluon fusion production cross section relative to the Standard Model prediction.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Monday 16 May 2011

Comments :

Abstract submitted on behalf of the CDF and D0 Collaborations. Once the program of parallel sessions has been settled, please contact Giorgio Chiarelli (giorgio.chiarelli@pi.infn.it), head of the CDF Speaker's Committee, and Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 285

Combined CDF and D0 upper limit on MSSM Higgs boson production in in \sqrt{s} collisions at $\sqrt{s}=1.96$ TeV

Content :

We present combined results on the search for a neutral Supersymmetric Higgs bosons with data collected at the CDF and D0 experiments. Data were collected in $p\bar{p}$ collisions at a centre of mass energy of 1.96 TeV during Run II of the Tevatron. The searches considered cover the main production and decay mechanisms for Higgs bosons in these models: $gg, b\bar{b} \rightarrow h \rightarrow \tau^+\tau^-$, $h(b) \rightarrow b\bar{b}$ and $h(b) \rightarrow \tau^+\tau^-(b)$. The resulting combination is interpreted in the context of different scenarios within the Minimal Supersymmetric Standard Model.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Sunday 08 May 2011

Last modified on : Sunday 08 May 2011

Comments :

Abstract submitted on behalf of the CDF and D0 Collaborations. Once the program of parallel sessions has been settled, please contact Giorgio Chiarelli (giorgio.chiarelli@pi.infn.it), head of the CDF Speaker's Committee, and Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 286

Combined CDF and D0 upper limit on Fermiophobic Higgs boson production in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present combined results on the search for a Fermiophobic Higgs boson with data collected at the CDF and D0 experiment. Data were collected in $p\bar{p}$ collisions at a centre of mass energy of 1.96 TeV during Run II of the Tevatron. The searches considered cover the main production and decay mechanisms in this model: associated production (VH , $V=W,Z$) and vector-boson fusion ($VV\to H$, $V=W,Z$), with $H\to\gamma\gamma, WW$. This combination significantly improves upon previous results from the combination of searches at LEP experiments.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Higgs Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

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Abstract submitted on behalf of the CDF and D0 Collaborations. Once the program of parallel sessions has been settled, please contact Giorgio Chiarelli (giorgio.chiarelli@pi.infn.it), head of the CDF Speaker's Committee, and Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.

Abstract ID : 335

Measurements of the single top quark production cross section and $|V_{tb}|$ in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV

Content :

We present new measurements of the single top quark production cross section in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV using data corresponding to 5.4 fb^{-1} of integrated luminosity collected by the D0 detector at the Fermilab Tevatron Collider. The events are selected with an isolated electron or muon missing transverse energy, two, three or four jets, with one or two of them identified as originating from the fragmentation of b quarks. From the cross section measurement we obtain new bounds on the Kobayashi-Maskawa $|V_{tb}|$ matrix element.

Primary authors : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Co-authors :

Presenter : Dr. VERZOCCHI, Marco (Fermilab - PPD Division)

Track classification : Top Quark Physics

Contribution type : Parallel contribution

Submitted by : Dr. VERZOCCHI, Marco

Submitted on Tuesday 10 May 2011

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Comments :

Abstract submitted on behalf of the D0 Collaboration. Once the program of parallel sessions has been settled, please contact Horst Wahl (wahl@hep.fsu.edu), chair of the D0 Speakers' bureau, for the speaker's assignment.